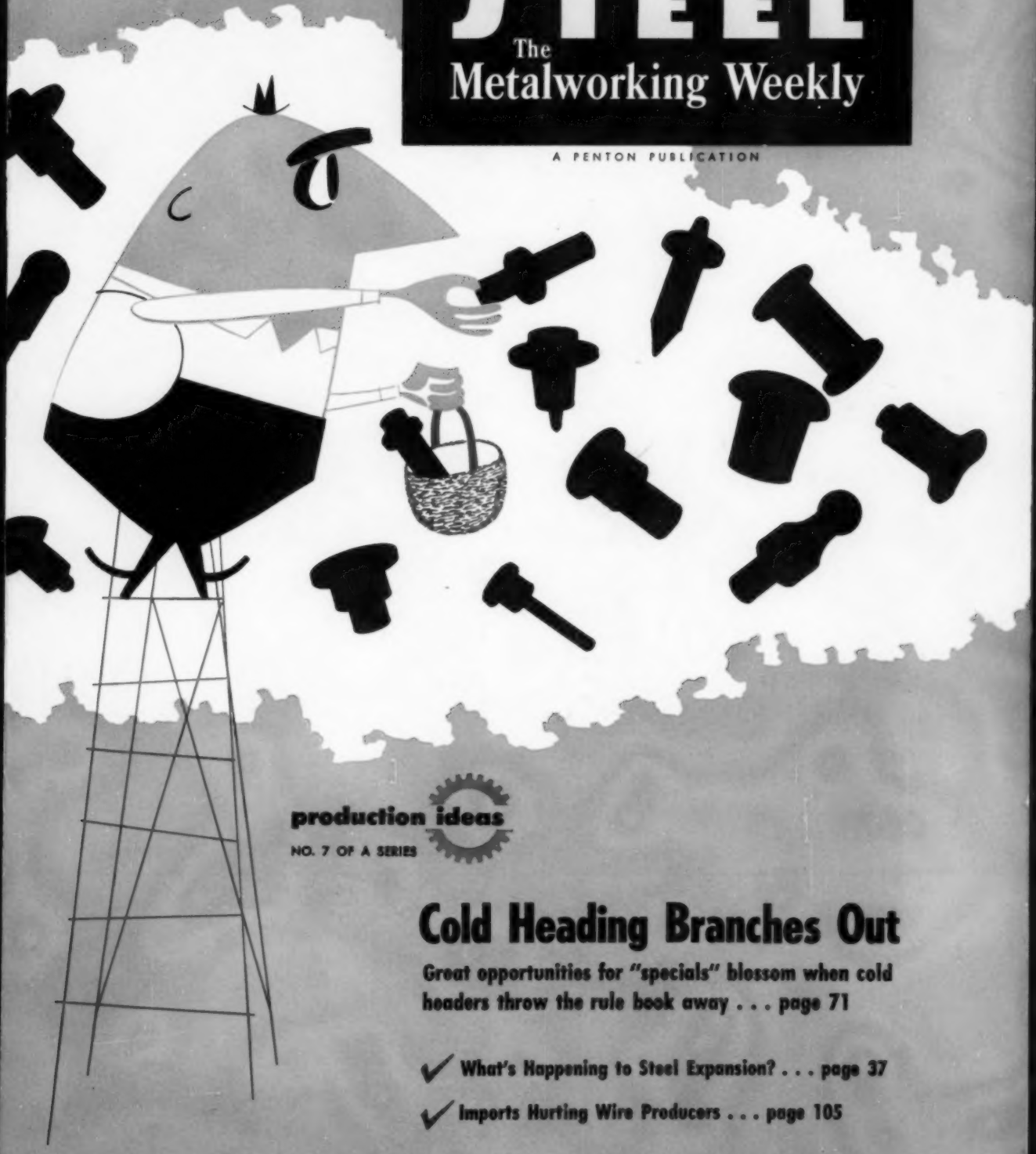
JANUARY 14, 1957

STEEL
The Metalworking Weekly

A PENTON PUBLICATION



production ideas
NO. 7 OF A SERIES

Cold Heading Branches Out

Great opportunities for "specials" blossom when cold headers throw the rule book away . . . page 71

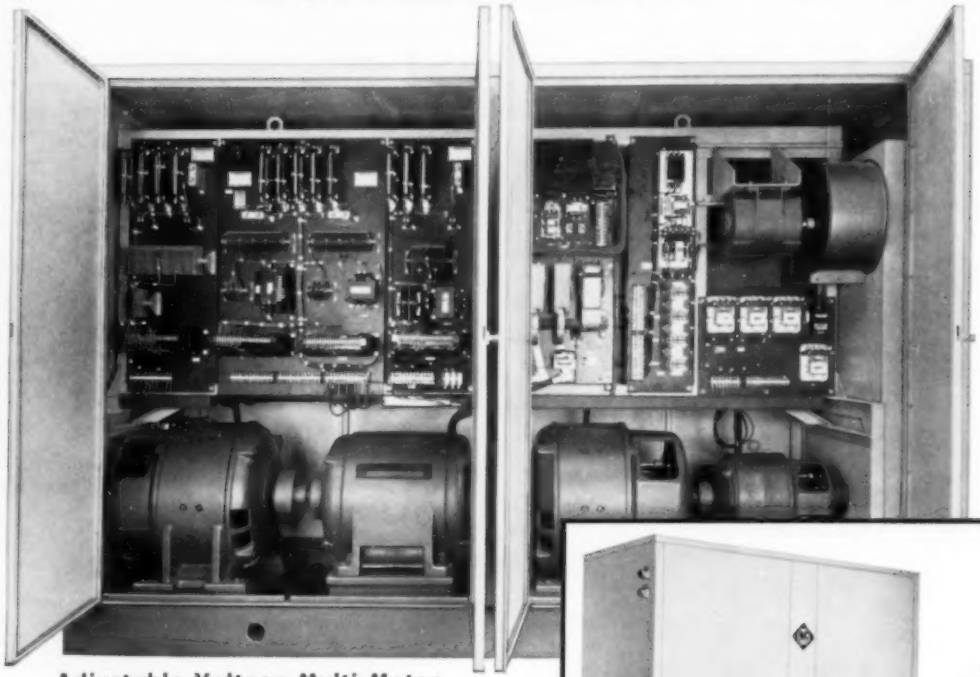
✔ What's Happening to Steel Expansion? . . . page 37

✔ Imports Hurting Wire Producers . . . page 105

CONTENTS — PAGE 5

There's MORE dependable speed control

- high response
- high shock resistance
- no fragile parts
- no maintenance



Adjustable Voltage Multi-Motor Package Drive used with heat flattening and coating equipment. Unit features magnetic amplifier control of tension and strip speed.

Size 3 Adjustable Voltage Power Unit rated 30 hp, of standard construction. Magnetic amplifier excitation provided.

Every one of the design features of the Allis-Chalmers Adjustable Voltage Package Drive assures you an easy, dependable means of power conversion.

Key to Package Drive dependability is the use of a magnetic amplifier to excite the field of the power unit m-g set. Sturdy and simple, this amplifier has no moving parts to wear out . . . no fragile components to be affected by vibrations. AND — there's no wasteful "warm-up" time needed. At the turn of a dial, you get immediate speed control.

Cost-saving assembly

M-g set and control components are assembled in the power unit enclosure at the factory — saving you installation costs. Enclosures used for 30 through 200-hp units are completely collapsible and may be easily disassembled without loss of rigidity. Larger units have separately driven blowers to provide positive ventilation and pressure even when unit is idle.

Available in units from 5 to 200 hp, the package drive is ideal for any application requiring adjustable speed. Contact your nearby Allis-Chalmers sales office or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

A-5299

How his inventories cut your overhead

To the buyer who needs steel or steel products in small and moderate amounts, the local distributor can often be a great source of economies. He can effect savings for his customers in many ways. Consider, for instance, the matter of inventories.

The distributor is a warehouseman. He has large stocks of plain and galvanized sheets, corrugated roofing, fence, fence posts, nails. Often he carries strip, bars, plates, structurals, wire, tool steels, wire rope, and other essential items. These products flow into and out of his warehouse daily. They are always available to the customer — to *you*. In essence they are no farther away than your telephone.

When you look to the distributor to meet your needs, you save the burdensome costs of maintaining large inventories of your own; costs that include insurance, taxes, handling, special equipment, space required, and clerical help. These items of overhead are far too heavy to be classed as "incidentals." They come to a very large sum, and the customer himself has to bear them if he builds up sizable stocks.

You can avoid the inventory headache — and expense — when you let the Bethlehem distributor fill your requirements. Why not call him and learn how fully he can be of service to you? He has much to offer, and all of it is good.

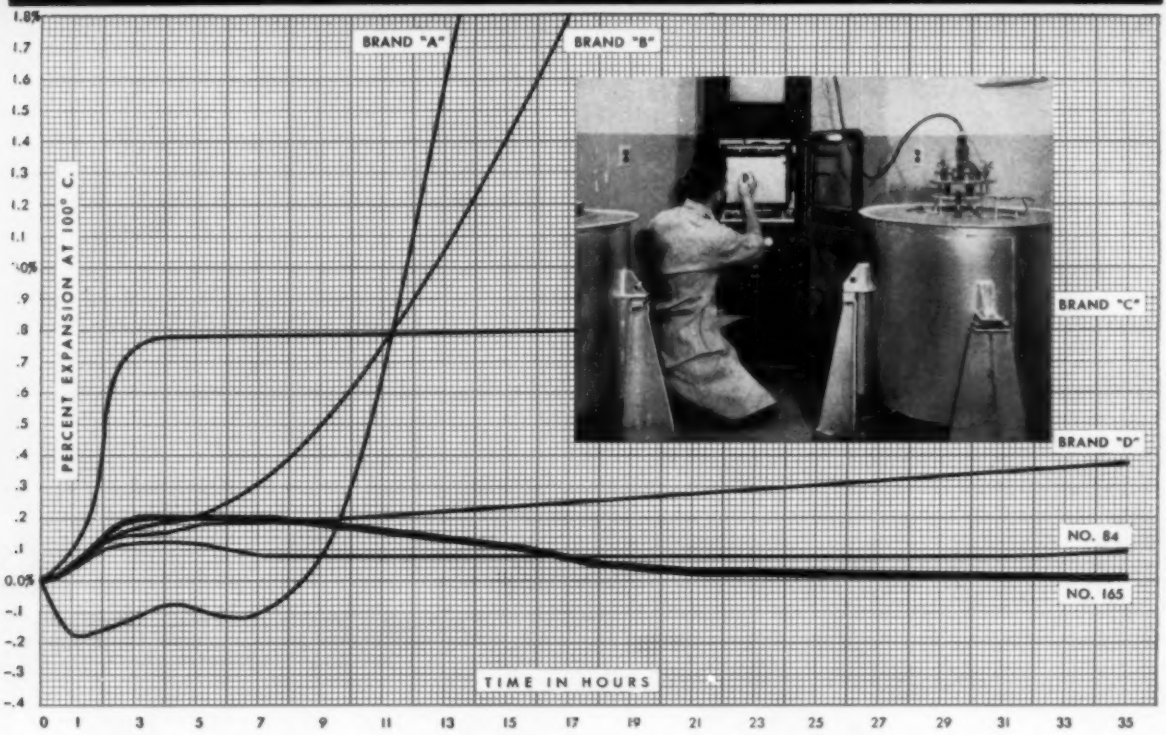
BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.
Bethlehem Pacific Coast Steel Corporation
San Francisco

BETHLEHEM STEEL

Call the distributor—your Shopping Center for Steel

DILATOMETER VOLUME STABILITY TEST

"SOAK AND SWELL" CHART shows why Permanente 165 Ramming Mix gives longest-life furnace bottoms



HYDRATION—reaction with water—during the heat-up period usually causes swelling of rammed magnesia bottoms. Leading ceramic engineers believe that as little as 0.3% expansion indicates damaging hydration, shorter bottom life.

To measure these minute expansions, Kaiser Chemicals Research developed the sensitive electronic instrument shown above. This device, called a dilatometer, can accurately measure and record expansions of less than 0.01% and maintain a constant temperature within ±0.5°C.

Dilatometer Traces Charts

For the test charted above, equal size blocks freshly prepared from each of six well-known ramming mixes were placed in a common heating chamber and attached to the recorder.

The chamber was then heated to just below the boiling point of water with the atmosphere held at 100% relative humidity to create forced hydration conditions. Finally, the samples were allowed to soak for 35 hours to simulate hydration conditions which a mix may encounter in the deeper regions of a bottom.

As you can see in the chart, Permanente 165 shows virtually no signs of expansion ... proof that it resists hydration significantly better than any other ramming mix tested. (Permanente 84 Hot Patching Mix runs a very close second.)

Research Aids Bottom Performance

Permanente 165's outstanding resistance to hydration is an excellent example of how Kaiser Chemicals Research is working to give you furnace bottoms that last longer, need fewer repairs. Why not let your Kaiser Chemicals Sales Engineer provide research, design and installation assistance to help you take advantage of this superior ramming mix?

Call or write Kaiser Chemicals Division, Dept. R7222, Kaiser Aluminum & Chemical Sales, Inc., at any of the addresses listed below:

PITTSBURGH 22, PA. . . . 3 Gateway Center
HAMMOND, IND. . . . 518 Calumet Building
OAKLAND 12, CALIF. . . . 1924 Broadway

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Pioneers in Modern Basic Refractories

Refractory Brick and Ramming Materials • Castables & Mortars
Magnesite • Periclase • Deadburned Dolomite

®Traveloader..reduces pipe-handling to an easy one-man job!

BAKER TRAVELOADER picks up loads from the side, carries them lengthwise—safely aboard the truck deck, and stacks them from the side to a height of 12 feet. This makes it the ideal truck for yard handling of pipe or any other long, unwieldy loads. It can operate in 10 ft. aisles, over paved and unpaved roadways—with travel speeds up to 30 MPH.

This one machine with one operator replaces two and often three fork trucks, straddle trucks, portable cranes or straddle carriers—and does the job better. You save manpower, cost of buying and maintaining other expensive equipment, aisle space and time. Unlike a straddle carrier, it also stacks. It requires less aisle space than fork trucks. And it eliminates dangerous dangling and swaying of loads carried by cranes. For complete information, write for Bulletin No. 1360.

Baker®
industrial trucks

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Otis

6T-4

Rx: For a Profit-Tonic

Use your Imagination and your Industrial Supply Distributor

Let him help you COUNT your way to Lower-Cost Operation

When you come right down to it, how do you *know* . . . how can you be *sure* of anything . . . *unless you count?* And when you take a calculating look, you'll find that almost every machine, process and system in your plant can be more closely *Count*rolled . . . cost-wise . . . by the addition of Veeder-Root Counters that supply production, payroll, inventory and tax figures, plus a running check on mechanical performance.

It's easy to attach standard Veeder-Root Counters to existing equipment . . . as your Industrial Supply Distributor will show you. And if special counters are needed, he will bring a Veeder-Root engineer to consult with you. So call your distributor today . . . *he's a man you can count on.*

SMALL RESET COUNTER

A compact, rugged reset counter for moderate duty in parts inspection, quality control, conveyors, machine tools, light presses, etc.

Dimensions: 1¾" long, 1 19/64" high, 1 7/16" wide

Speed: Up to 1000 counts per minute.

BOX-TYPE RESET COUNTER

For punch press installations, conveyors, metal-working equipment, die casting, plastic-molding, rivet, spring and wire machining, or any installation requiring a heavy duty counter.

Dimensions: 4¼" long, 2 3/32" high, 3 3/8" wide. Speed: 500 counts per minute.

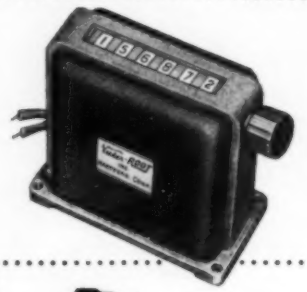
RESET MAGNETIC COUNTER

For remote indication of machine operation from plant to office.

Dimensions: 3 15/16" long, 2½" high, 1 5/8" wide.

Speed: Up to 1000 counts per minute.

Coils: 110V-AC are standard. Other voltages are available. Panel mounting feature also available.

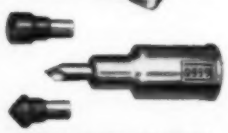


HAND TALLY

For quick spot-checks of production or performance.

Dimensions: 1 17/64" long (to end of reset knob), 1¾" deep, 2" high.

Counts one for each depression of the thumb lever, and resets to zero by a turn of the knob.



CLUTCH SPEED COUNTER

For checking to make sure that the machine is operating at the required R.P.M.

Dimensions: 3¼" long, ⅜" max. diameter. Non-Reset.

Internal clutch operates counter only when rubber tip is pressed against the shaft.

Insist on Standard

VEEDER-ROOT COUNTERS

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or write us on special problems

Everyone can count on

VEEDER-ROOT

"The Name that Counts"

IN THIS ISSUE

STEEL
The Metalworking Weekly

January 14, 1957
Vol. 140 No. 2

METALWORKING OUTLOOK

31 **Nation's output should reach new records in 1957,** predicts GE's Ralph Cordiner

☑ 37 **Steel Expansion**—Less than $100 million of plans will be canceled because of U.S. refusal to grant tax-am

39 **Republic Expands**—Boosts steel melting capacity at Gadsden, Ala.

40 **Record Set in Electrical Resistance Welding Machine Sales**—Pace in '57 expected to be only slightly below last year's

41 **Demand for Transistors Soars**—Markets are limitless, industry contends

42 **Who's Who in Atomics**—Score card is brought up to date

43 **Profit Sharing Tied to SUB**—How Leeds & Northrup's plan works

☑ 48 **Business Planes Fly High**—Sales records set in 1956

49 **Trend to LP Gas Cited**—Sales in 1956 increased 16.7%

TECHNICAL OUTLOOK

69 **Hot Forging Die**—New die steel developed for forging high temperature alloys shows up well in tests

70 **Soluble Cores Aid Casters**—For nonretractable cores, a mixture of soluble wax and powdered mica is recommended

COVER ARTICLE

71 **Cold Heading Branches Out**—Many jobs once thought impossible are now being done by this method

75 **Shearing Squares Up Billet Ends**—It's the fastest way to prepare for hot forging and cold extrusion

78 **Progress in Steelmaking**—Scrap, Ingots, Smoke and Silicon—Electric furnace steelmakers hit hard at today's problems

86 **Coupling Tapper Boasts Automatic Cycle**—Pipe couplings flow through new machine at rates up to 96 an hour

☑ 88 **Kaiser's New Cranes Are Aluminum**—A new alloy, sigma welding and Heliarc cutting put them within reach of most factories

MARKET OUTLOOK

103 **Delivered Prices on Steel Are Rising**—Indexes and composites, 113; steel prices, 115; ores, 121; ferroalloys, 122; scrap trends, 124, prices, 126

☑ 105 **Imports Pose Threat to Wire Products Makers**—Plants, machines in Southeast idled by influx of cheaper goods

128 **Nonferrous Metals**—Supply Overtakes Demand—Prices, 130

REGULAR FEATURES

6 Behind the Scenes
10 Letters to The Editors
16 Staff Listing
21 Calendar of Meetings
35 The Editor's Views
44 Windows of Washington
47 Management at Work
51 Mirrors of Motordom
55 The Business Trend
59 Men of Industry
84 Machine Topics
91 New Products
100 New Literature
133 Advertising Index

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IF METALWORKING PLANTS ARE YOUR PROSPECTS

STEEL can put you in touch with the important ones, those that do more than 92% of the industry's business. Tell the buyers and specifiers in these plants of the machines or materials you have for sale through an "Equipment — Materials" advertisement. For rates write STEEL, Penton Building, Cleveland 13, Ohio.

behind the scenes

Cold Forming Is Hot Stuff

If you happen to be a man deeply concerned with the possibilities of making more money with cold heading, the article on page 71 should be to your liking. Cold heading is, of course, cold forging, and when we asked one of our metallurgists why cold work hardens the metal, we got a load of double talk. "Because a ductile metal like iron deforms plastically under cold work or stress beyond the elastic limit by internal slip along crystalline planes," he declared. "It would appear that this slip has the effect of breaking up the original crystals into numbers of small ones. For that reason, cold work hardens the metal."

Did you ever hear anything so preposterous? Sometimes even the simplest question can stir up answers that would stump a Rhodes scholar. Fortunately for readers of STEEL, however, the article on cold heading is concise and factual. An "Idea for Industry" report, it calls attention to today's improved dies, and explains why cold forming has long since spread beyond the bolt and rivet field. There's a heap of new business possibilities in the cold forming trade, friends, and it doesn't make any difference if the metallurgist is the only one who knows the difference between crystalline planes and Constellations.

Annual Meeting

Last Thursday and Friday the editors of STEEL assembled and took thought. They listened to one another, to outside views, to the publishers—indeed, they listened to practically everybody who had anything at all to say about improving their product. Editor-in-chief Irwin Such blew the whistle, so to speak, and they were off. Editors learned about promotion, sales objectives and circulation. The highlight of this round table of self-examination was a report by George Samerjan, the New York art consultant. Here in the Ohio backwoods New York consultants are highly esteemed, so when Mr. Samerjan rose to tell us what he thought about STEEL you could have heard a 5 pt. period drop.

You folks who read STEEL, now, are your aesthetic senses disturbed by the occasional ill-advised juxtaposition of colors in the magazine? Do some of our covers cause you to skip the articles they were intended to advertise? And honestly, now, do you really care—deep down, that is—if STEEL is printed in 9 pt. Ideal instead of Garamond? Well, there's nothing like a professional outside view to make you rearrange your estimates.

Nothing But Improvement

A more practical outside view (you see, we're for the readers 100 per cent!) was given by a panel of four readers from the business world: William I. Ong, assistant to the president, American Steel & Wire Division, U.S. Steel Corp.; William Mogg, manager, Special Products Division, Clevite Corp.; George Meyer, general superintendent, Warner & Swasey Co.; and L. W. Curren, purchasing agent, Van Dorn Iron Works. Representative of four levels of management, these gentlemen described how they use the business magazine and what they expect it to do for them.

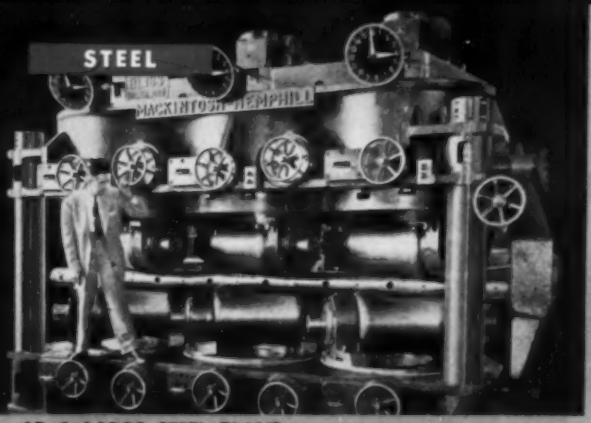
Copy Editor Harry Chandler later struggled through a description of Tell-Graphic, a new concept of visual presentation. It rather makes you fearful to consider the amount of material a skillful editor can direct into your head when he employs these latest strategems in printed communication.

George O. Hays, president, Penton Publishing Co., publishers of STEEL, spoke to the staff and its guests Thursday evening in the Ranch Room of the Cleveland Athletic Club. Mr. Hays's subject was "The Challenge of Leadership," and we'll never know exactly what he said because we were home battling a virus while he was outlining the duties of a front runner.

These annual meetings are constructive. Yogilike, STEEL examines itself, considers its duties to its readers and advertisers, spotlights its faults, develops its virtues and goes into the New Year like a broncho into the arena—healthy, frisky and rarin' to go.

Shrdlu

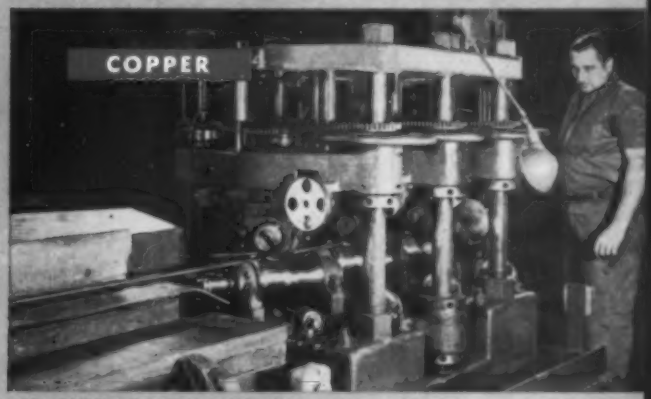
(Metalworking Outlook—Page 31)



AT A LARGE STEEL PLANT...
This A-5 recently shipped to an eastern steel plant is the largest 6-roll straightener in the world; straightens electric-weld steel pipe in diameters between 4½" and 16", in 16-to-65 foot lengths at speeds up to 240 feet per minute. It illustrates the three-post design now available in large models of the Mack-Hemp straightener.

AT ALCOA...
This Model AX has recently gone into operation at Alcoa's New Kensington, Pa., plant. It straightens from 100 to 150 tons of aluminum alloy tubing every month. Guideless design and power drive to all six rolls enable Mack-Hemp to successfully production-straighten easily-marked aluminum tube.

AT BELL AIRCRAFT...
At this aircraft producer's Buffalo plant, this three-post Model AY straightens 3/16" O.D. 304 Stainless Steel tubing which Bell makes into rocket engine components. The machine raised Bell's straightening capacity from 570 feet to nearly 7500 feet per day... more than *thirteen* times as much!



AT CHASE BRASS & COPPER...
This Model AN, with capacity of ½" to 3" O.D. is one of three Mack-Hemp straighteners at Chase's Cleveland plant. The Models AXY, AX and AN together provide overlapping capacity for 3/16" up to 3" O.D., in straightening brass or copper tube and in "light tempering" annealed copper tube.

For premium tube straightness and roundness at high production speeds...

The MACK-HEMP Guideless Rotary Tube Straightener

- All six rolls driven—no guides—surface of straightened tubing is unmarked.
- Eliminates end bends and ovality; provides premium straightness and roundness over full length of tube.
- Rugged, heavy-duty construction.
- Models for all O.D.'s from 0.050" to 16" of ferrous and non-ferrous pipe and tube.
- Speeds up to 800 feet per minute.
- Easy to reset for different diameters—all models now available in three-post construction. Fast roll adjusting mechanism is enclosed and protected from scale and water.

ALL MODELS ARE NOW AVAILABLE IN MACK-HEMP'S EXCLUSIVE THREE-POST CONSTRUCTION

For complete details on Mack-Hemp Straighteners, write today for a free copy of our 24-page Technical Bulletin No. 55, "How to Straighten Pipe and Tube."

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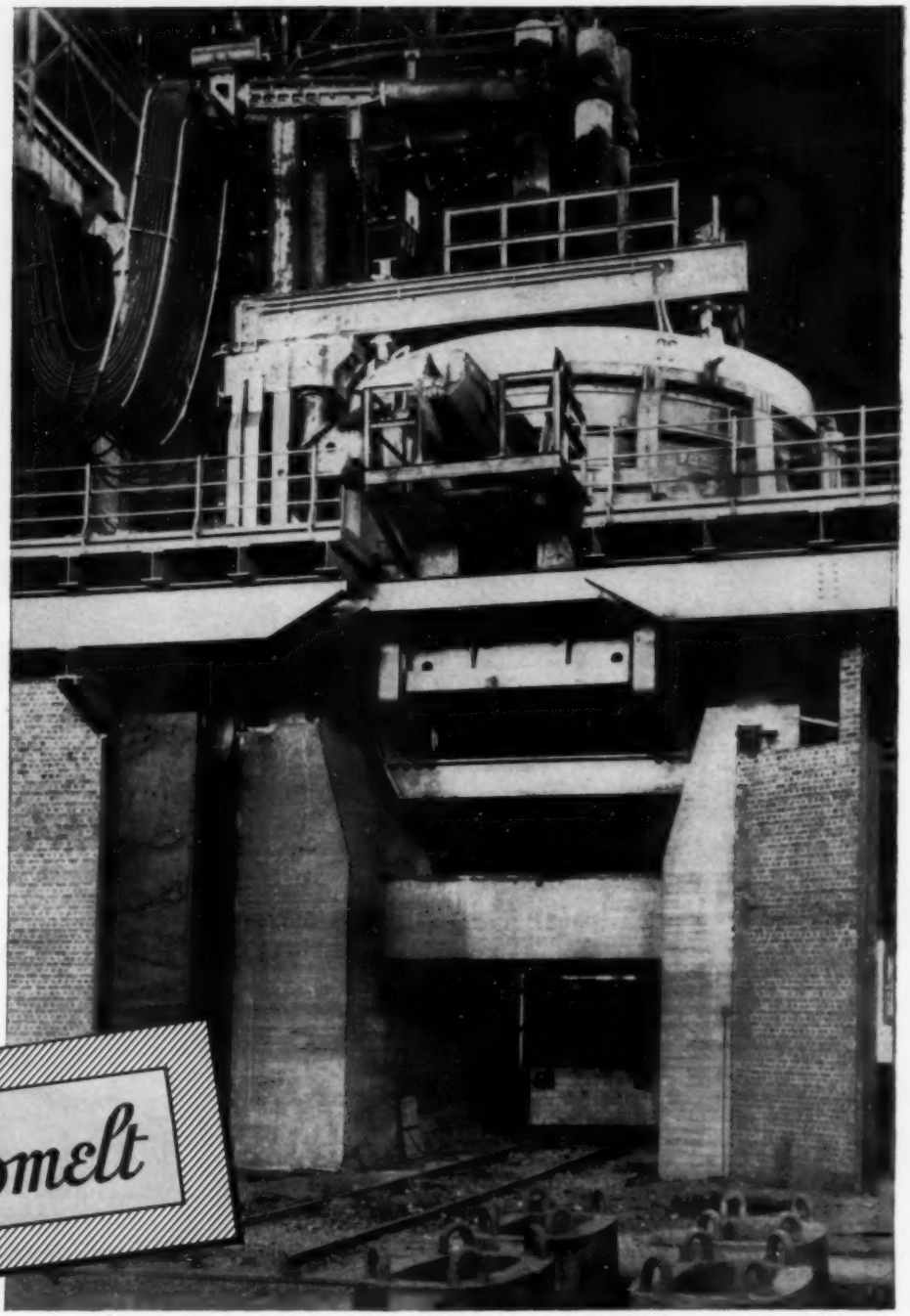

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ERIE FORGE & STEEL CORPORATION

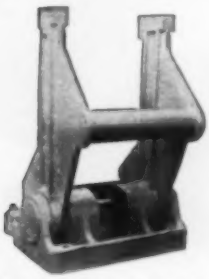
Powerful Melting Furnace

To Lectromelt Specifications . . . .

STEEL CASTINGS — FORGINGS

BY-*Erie Forge & Steel Corporation*

Cast Steel Roof Lift Cylinder
and Cylinder Head
Weight—Cylinder 13,500 pounds
Head—3140 pounds

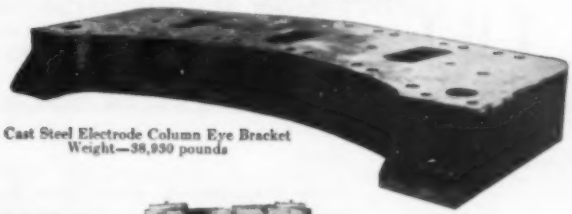


Cast Steel Tilting Cylinder Sole Plate
and Bumper Block Side Castings
Weight—3040 pounds

Cast Steel Roof Swing Cylinders
Weight—2750 pounds

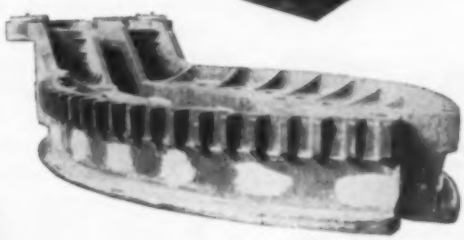
Cast Steel Roof Lifting
Ram Socket Bracket
Weight—25,660 pounds

Cast Steel Hydraulic Tilting Cylinder Assembly
Steel Castings each end—Weight—2475 pounds

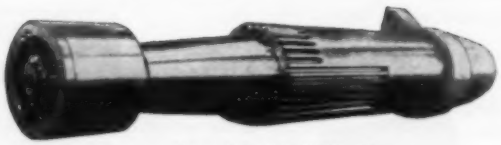


Cast Steel Electrode Column Eye Bracket
Weight—38,930 pounds

Cast Steel Pedestal Track
Weight—19,500 pounds



Cast Steel Furnace Bottom Rockers—2 Halves
Weight—30,500 pounds each



Forged Steel Roof Lifting Ram
Weight—55,700 pounds

Cast Steel Roof Lifting Piston Head
Gland Ring and Cap Assembly
Weight—2900 pounds

Cast Steel Roof Ram Buttress
Weight—3880 pounds

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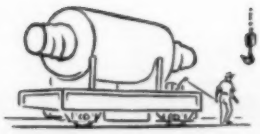
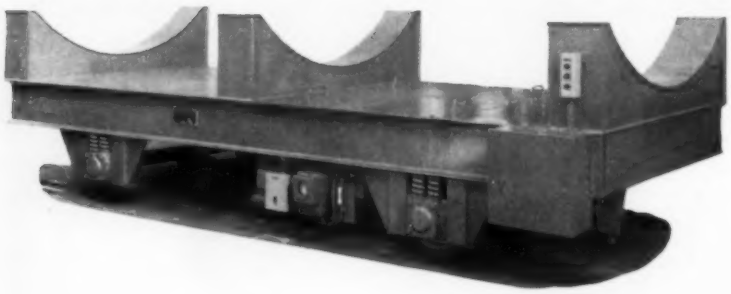
Links up your HANDLING NETWORK



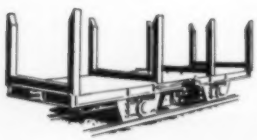
for added efficiency . . .

extra economy

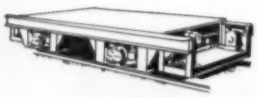


ATLAS WALK-ALONG

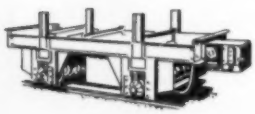
SAFETY-TYPE TRANSFERS



Special bed designs to cradle your load.



Single platform or double platform-operater rides.



Versatile power . . . diesel or gas electric, storage battery, or cable reel. Also remote control with no trailing cable.

If you're responsible for maintaining safe, low cost movement of heavy loads (5 to 200 tons) and intermediate transfer of these loads during process or storage, Atlas can help you by engineering a transfer car to meet your exact load and power requirements.

Atlas engineering gives you every modern safety feature for personnel protection.

. . . choice of power and control including:

1. Single lever (walk-along) forward, reverse with safety stop when lever is released.
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LETTERS TO THE EDITORS

Economist Appreciates STEEL

We get STEEL here at the Board, and I go through it carefully each week. I should be grateful if you would send tear sheets of the article, "We're Ready for Volume Business, Say Extruders of Titanium," Parts I (Dec. 10, page 142) and II (Dec 17, page 100).

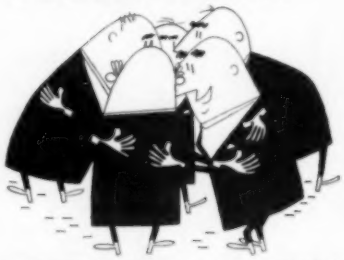
F. E. Richter
Economic Advisor
The Renegotiation Board
Washington

Copies to Department Heads

We were interested to read your article, "Steel Warehouses Hold Pace" (Dec. 24, page 33). We would appreciate receiving five copies for our department managers.

H. G. Seybold
Vice President
Drummond, McCall & Co. Ltd.
Montreal

Of Interest to Sales Force



We would appreciate 18 copies of the article, "Fine Grained Brass for Deeper Draws" (Dec. 24, page 66). We believe this would be of interest to our sales force.

P. M. Vincent
Vincent Brass & Aluminum Co.
Minneapolis

Engineer Shortage: Big Problem

Your article, "I Have Enough Engineers" (Nov. 12, page 130), is of interest to us because a related problem exists in our organization. Please send four reprints so that we may submit them to other interested members of our department to study.

R. E. Mahr
Materials Laboratory
Missile Operations
Chrysler Corp.

Experimenting with Method

We would appreciate an extra copy of the article, "Gas-Fired Machine Brazing" (Oct. 29, page 124). It is excellent. We are experimenting with this method.

L. F. Bonofiglio
Superintendent
Industrial Engineering
Colorado Fuel & Iron Corp.
Pacific Coast Division
Oakland, Calif.

Appreciates Information

Please send two extra copies each of the Program for Management articles, "Motivating Men To Produce More" (Sept. 24, page 105) and "Industry and College — Partners in Development" (Nov. 12, page 119). I would like to

(Please turn to page 12)

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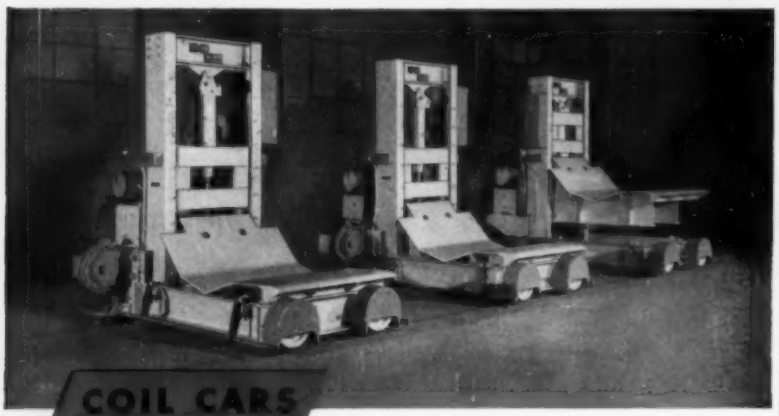

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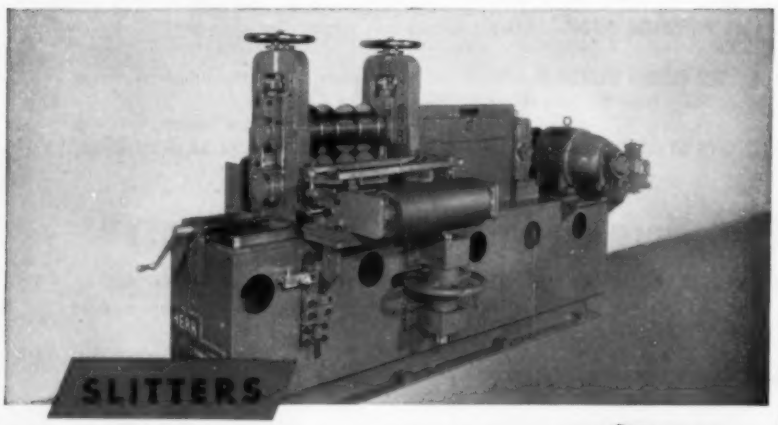

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LETTERS

(Concluded from page 10)

express my appreciation for the information given in these articles and the service you render in making extra copies available.

Damon C. Ralph
Industrial Engineer
Temco Aircraft Corp.
Dallas

Reader Likes Forge Articles

Your article, "Split Die Forging Solves a Problem," (Nov. 26, page 94) has been of interest to us, and we would like 10 copies. We enjoy receiving your interesting and useful magazine and hope to see more articles of a similar nature.

Don Hallenbeck
Product Manager
Forge Division
Harvey Aluminum
Division of Harvey Machine Co. Inc.
Torrance, Calif.

Purchasing Agents To Reprint

I am interested in the article, "Let Traffic Managers Manage" (Nov. 26, page 68). As secretary of the Purchasing Agents Association of Chicago, I would like permission to reprint it (with credit to STEEL) for distribution to our membership.

L. R. Been
Borg & Beck Division
Borg-Warner Corp.
Chicago

• *Permission granted.*

Get Realistic Profit Picture

Your recent article, "Self-Help on Depreciation" (Nov. 19, page 99), was most interesting and timely. We would appreciate an extra copy.

J. E. Vasgaard
Superintendent
Technical Division
R. J. Reynolds Tobacco Co.
Winston-Salem, N. C.

Modern Soldering Methods

We read with interest your issue of Dec. 17 and, especially, the article, "Soldering Keeps Up to Date" (page 86). We would appreciate four copies.

C. Ruford Franklin
Purchasing Agent
Standard Container Inc.
Montclair, N. J.

Efficient Use of Blast Furnace

Please send a tear sheet of Part II of the article, "More Iron Without More Furnaces" (Nov. 26, page 98). Thank you for your fine presentation of this article.

J. M. Howard
Assistant Chief Engineer
Inland Steel Co.
East Chicago, Ind.

Praise for Fine Job

Your article, "Metal Powder Parts Get New Look" (Dec. 3, page 121), was of interest to me. Especially, the mention about the use of sintered oil impregnated bearings in appliance motors. Where can I obtain more information about this?

Lawrence E. Gray
Tool Designer
Appliance Motor Department
General Electric Co.
De Kalb, Ill.

• *Contact: S. S. Connor, Vice President and Secretary, Bound Brook Oil-Less Bearing Co., Bound Brook, N. J.*

From 5 basic models you get 10 standard relays with the new CLARK Type "PM" Relay line

The 5 Basic Models

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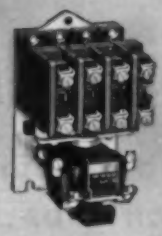
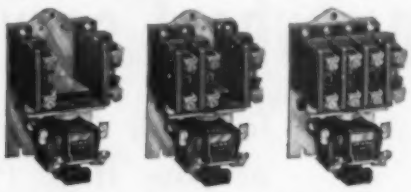
No. 5U-4
Basic
4-Pole

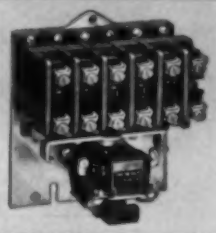


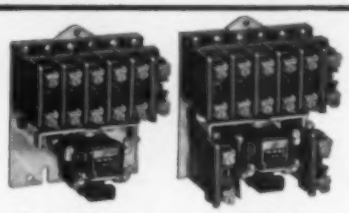


2-POLE 3-POLE 4-POLE

By removing one or two poles, the standard 4-pole unit becomes a 2 or 3-pole relay.

No. 5U-6
Basic
6-Pole

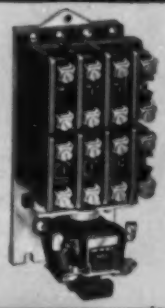


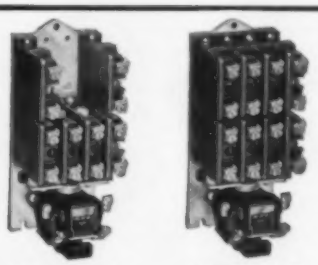


6-POLE 8-POLE

By adding 2 poles next to magnet, the standard 6-pole relay becomes an 8-pole unit—*the first 8-pole relay available for single deck wiring.*

No. 5UK-8
Basic
8-Pole

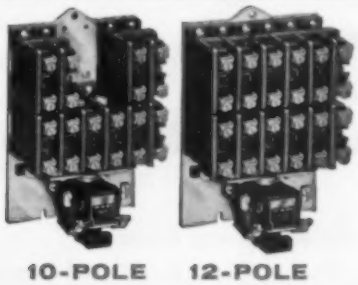




6-POLE Double-decked 8-POLE Double-decked

By removing 2 poles from the double-decked 8-pole relay, you get an alternate 6-pole of double-deck construction.

No. 5U-12
Basic
12-Pole



10-POLE 12-POLE

With 2 poles removed, the 12-pole unit becomes the standard 10-pole relay. Both have identical mounting dimensions with NEMA standard size 1 starters.

No. 5UK-2
2-Pole

2-POLE "SPACE SAVER"—a special purpose relay designed exclusively to meet small or unusual space requirements. Overall height less than 3 inches.

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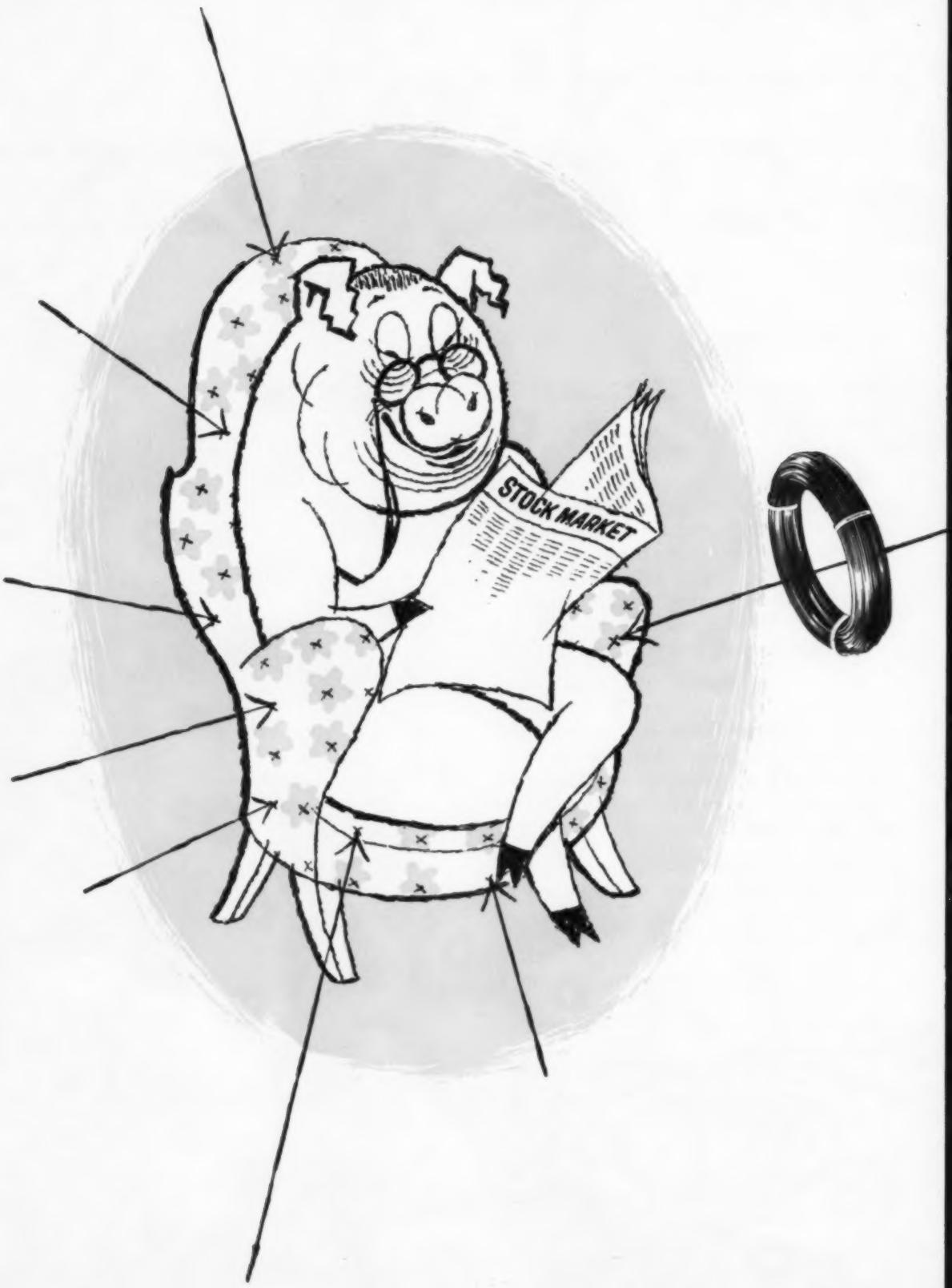
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Snake Fishing Steel
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Bonnet Wire
Bookbinder Wire
Broom Wire
Clip Wire
Dent Spacer Wire
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Hairpin Wire
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Mattress Wire
Picture Cord Wire
Picker Tooth Wire
Pin Ticket Wire
Pin Wire
Ring Traveller Wire
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Stapling Wire
Stapling Wire for Preformed Staples
Stone Wire
Weaving Wire
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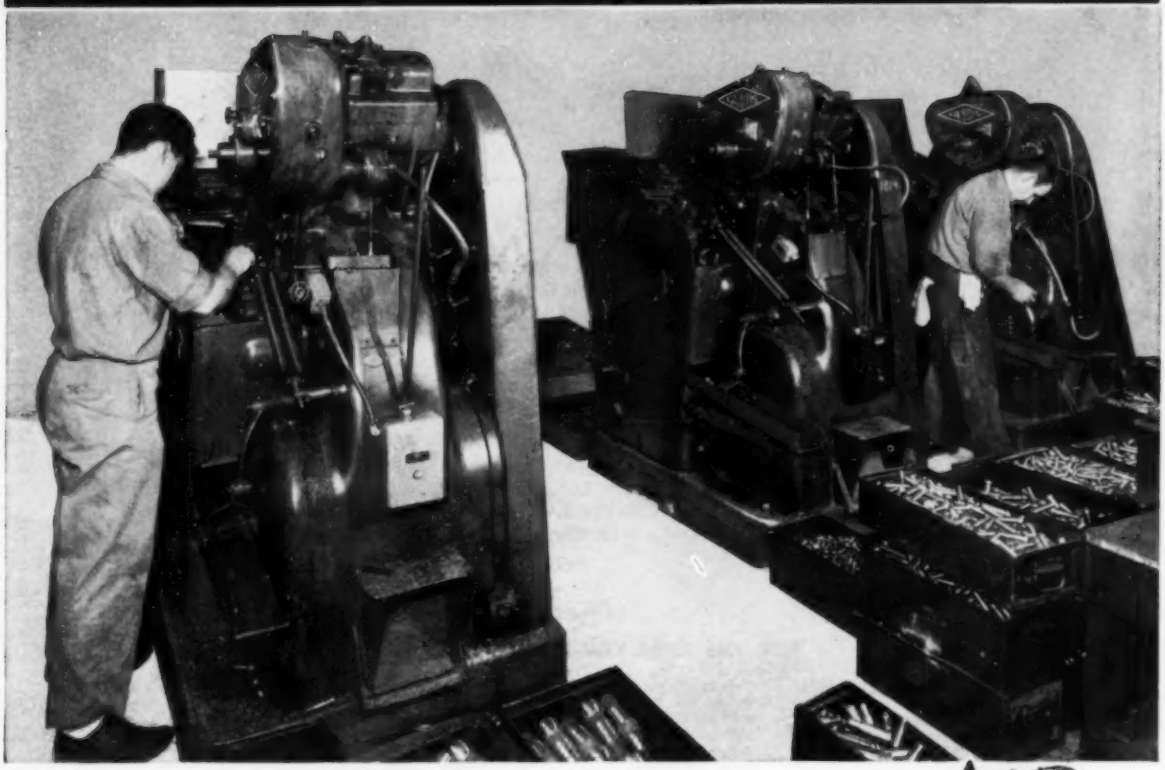

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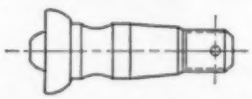

The workpieces are cold-forged blanks, from which ball studs are made. Specifications require a 45° point and a 9/16" 18-pitch N.F. thread cut to a length of 5/8". In constant daily operation is a battery of LANDIS Automatic Forming and Threading Machines, each of which point and thread 1020 pieces per hour. Four hours of production are obtained between each chaser grinding, resulting in low tool cost and minimum machine down time.

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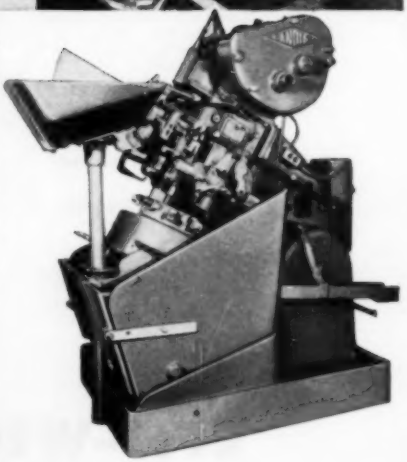
Can you revolutionize your pointing and threading operations with LANDIS Automatic Forming and Threading Machines? Please give specifications when writing for complete information.



LANDIS *Machine* COMPANY · WAYNESBORO PENNSYLVANIA

CALENDAR
OF MEETINGS

Jan. 14-18, Society of Automotive Engineers Inc.: Annual meeting, Sheraton-Cadillac and Statler hotels, Detroit. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Jan. 16-17, Caster & Floor Truck Manufacturers Association: Winter meeting, New Weston hotel, New York. Association's address: 27 E. Monroe St., Chicago 3, Ill. Secretary: H. P. Dolan.

Jan. 16-18, American Management Association: International management conference, Roosevelt hotel, New York. Association's address: 1515 Broadway, New York 36, N. Y. Secretary: Andrew P. Donovan.

Jan. 17-18, Steel Plate Fabricators Association: Annual meeting, Palmer House hotel, Chicago. Association's address: 79 W. Monroe St., Chicago 3, Ill. Secretary: J. Dwight Evans.

Jan. 18, Malleable Founders' Society: Semi-annual meeting, Hotel Cleveland, Cleveland. Society's address: 1800 Union Commerce Bldg., Cleveland 14, O. Executive vice president: Lowell D. Ryan.

Jan. 19-23, Truck-Trailer Manufacturers Association: Annual meeting, Del Coronado hotel, Coronado, Calif. Association's address: 710 Albee Bldg., Washington 5, D. C. Managing director: John B. Hulse.

Jan. 21-22, Solar Furnace Symposium: Westward Ho hotel, Phoenix, Ariz. Sponsor: Association for Applied Solar Energy, 3424 N. Central Ave., Phoenix, Ariz. Secretary: John I. Yellott.

Jan. 21-25, American Institute of Electrical Engineers: Winter general meeting, Hotel Statler, New York. Institute's address: 33 W. 39th St., New York 18, N. Y. Secretary: N. S. Hibshman.

Jan. 23-24, Steel Shipping Containers Institute Inc.: Winter meeting, St. Regis hotel, New York. Institute's address: 600 Fifth Ave., New York 20, N. Y. Secretary: L. B. Miller.

Jan. 24-26, National Tool & Die Manufacturers Association: Winter meeting, Biltmore hotel, Palm Beach, Fla. Association's address: 907 Public Square Bldg., Cleveland 13, O. Executive secretary: George S. Eaton.

Jan. 28-31, American Management Association: West coast general management conference, Hotel Statler, Los Angeles. Association's address: 1515 Broadway, New York 36, N. Y. Secretary: Andrew P. Donovan.

Jan. 28-31, Associated Equipment Distributors: Annual meeting and exhibit, Conrad Hilton hotel, Chicago. Association's address: 30 E. Cedar St., Chicago 11, Ill. Executive secretary: P. D. Hermann.

Jan. 28-29, Industrial Heating Equipment Association Inc.: Annual meeting, Shoreham hotel, Washington. Association's address: Associations Bldg., Washington 6, D. C. Executive vice president: Carl L. Ipsen.

Jan. 28-31, Plant Maintenance & Engineering Show & Conference: Public Auditorium, Cleveland. Information: Clapp & Poliak Inc., 341 Madison Ave., New York 17, N. Y.

Jan. 28-Feb. 2, American Road Builders Association: Road show and convention, Congress hotel and International Amphitheatre, Chicago. Association's address: 600 World Center Bldg., Washington 6, D. C. Executive vice president: Louis W. Prentiss.

Feb. 4-6, American Management Association: Marketing conference, Hotel Statler, New York. Association's address: 1515 Broadway, New York 17, N. Y. Secretary: Andrew P. Donovan.

Feb. 4-8, American Society for Testing Materials: Committee week, Benjamin Franklin hotel, Philadelphia. Society's address: 1916 Race St., Philadelphia 3, Pa. Executive secretary: Robert J. Painter.

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An extensive plant expansion program recently completed provides the reserve capacity and flexibility needed to meet both your regular and emergency *immediate shipment* requirements for washers of all types—standard and special, any size, any metal, any quantity. Joliet remains the world's foremost producer of washers.

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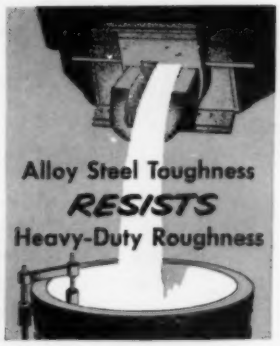

DRIVE AXLE

Model "660" Motor Grader is built by Adams Division, LeTourneau-Westinghouse Company, Indianapolis, Ind.

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DESIGNED FROM ALLOY STEEL

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Motor graders built by Adams Division of LeTourneau-Westinghouse Company are known throughout the world for quality and dependability.

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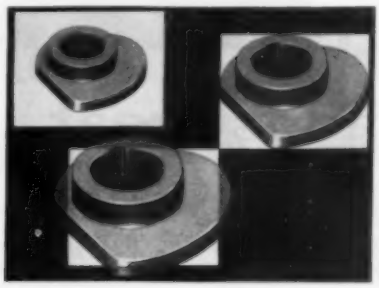
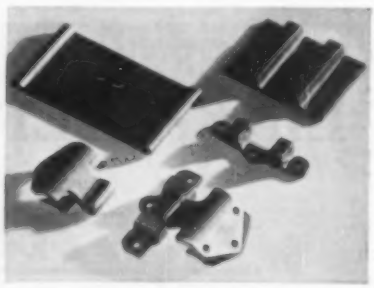
Alloy steels provide an outstanding combination of qualities essential to designing smaller sections to move or carry heavier loads with no sacrifice of strength or safety. They resist fatigue, shock and stress. Respond uniformly to heat treatment, producing hard, wear-resistant surfaces around tough cores. This tough, integral structure provides greater strength with minimum weight.

Specify Republic Alloy Steels for your jobs where strength and toughness must resist heavy-duty roughness. We offer you the services of our experienced field metallurgists to help you get the most from these versatile steels at the lowest possible cost. There's no obligation. Just mail the coupon.

COMPLETE DESIGN, engineering and fabricating facilities go to work for you as an extension of your plant when you have your stamped and drawn parts fabricated by Republic's Pressed Steel Division. This truck shaft bracket is one example of a wide variety of steel parts mass produced to specification at the lowest possible cost. Send coupon for Booklet Adv. 681.



DIE AND PART DESIGN PROBLEMS are reduced by 3 new grades of Republic Iron Powder with *Controlled Dimensional Factor.* In the presence of copper, these powders—depending on type—can be made to grow, remain stable, or shrink, within acceptable limits. Complete information on Type "G" for growth, Type "N" for normal, Type "S" for shrinkage are contained in Booklet Adv. 763. Write for it.



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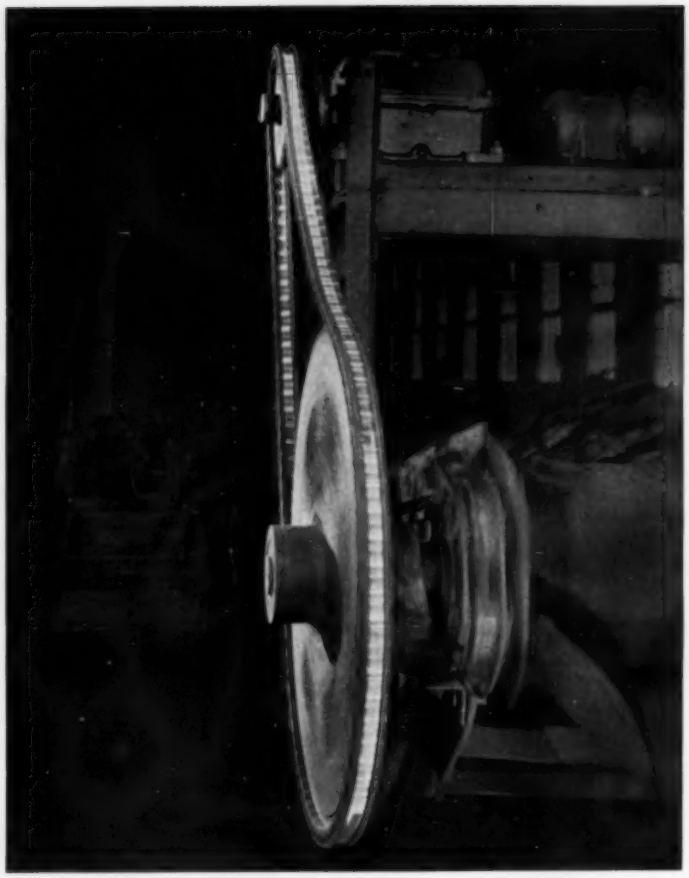
To static strength . . .

RESISTANCE TO TENSILE STRESS is achieved by use of properly heat-treated, accurately-machined sidebars made of premium steel and fitted with properly-hardened pins, bushings and rollers. But to resist *operational* stresses, additional controls over accuracy, uniformity and roller resiliency are essential.



STRENGTH OF CHAIN IN MOTION is accomplished through tensile strength *plus* special Link-Belt refinements. These include pitch-hole preparation, micro-finish of parts, special processing of sidebars, pre-lubrication and rigid quality control from initial selection of materials to final protective boxing.

LINK-BELT adds great

dynamic strength

that gives Precision Steel Roller Chain on-the-job endurance

WHEN selecting roller chain for your drive or conveying job, durability under actual working conditions is what you're after. That's *dynamic strength*—and it's built into *every length* of Link-Belt Precision Steel Roller Chain. From it comes resistance to such operating stresses as engagement with sprockets, shock of starting loads, centrifugal loads and others.

No one feature can establish high dynamic strength. It results from a combination of Link-Belt "extras" . . . plus other special methods of design, manufacturing and processing. On the job, it means extended life, positive action, less maintenance.

Ask your Link-Belt office or authorized stock-carrying distributor for Book 2457, covering single and multiple width roller chain and sprockets in ¼ to 3-inch pitch . . . and in double pitch, 1 to 3-inch.

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LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 14.123

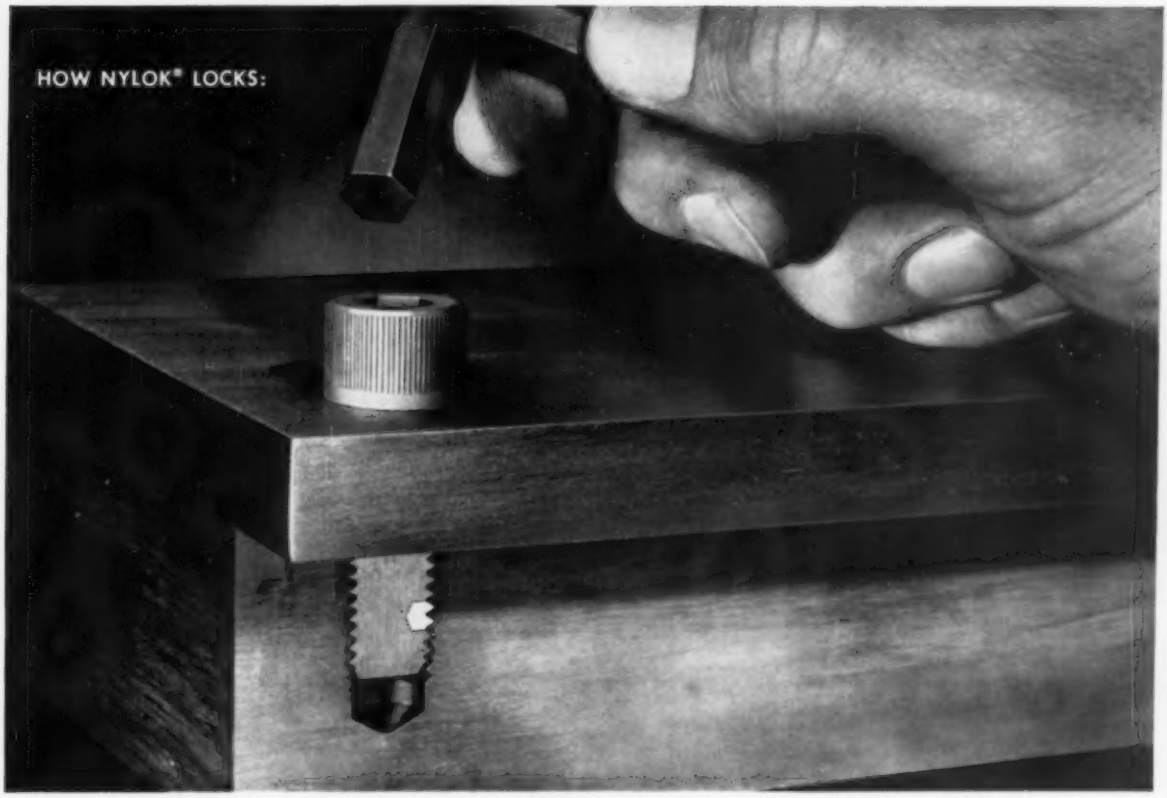
LINK-BELT gives you dynamic strength that comes from these important EXTRAS

PRE-STRESSING of multiple width chain provides uniform load distribution.

SHOT-PEENED rollers have greater fatigue life, added ability to withstand impact.

CLOSE HEAT-TREAT CONTROL — coupled with rigid testing insures uniformity.

LOCK-TYPE BUSHINGS (applied on a range of sizes) end a cause of stiff chain.



LOCKED! The tough, resilient nylon pellet keys itself into the mating threads. It forces threads together, and locks the screw securely.

NEW—a complete line of self-locking UNBRAKO socket screw products that won't work loose

They simplify design and save production time

UNBRAKO socket screws are now available embodying the Nylok* self-locking principle. Nylok provides a truly practical new solution to the problem of making screws self-locking.

You save production time when you build products with self-locking UNBRAKOS. And you get greater simplicity in design with less bulk and weight. The number of parts you must assemble to achieve full locking action is reduced to the absolute minimum. Lockwashers under screw heads are no longer necessary. Costly wiring of cross drilled heads is eliminated. So are cotter pins and complex multiple set screw installations.

Self-Locking UNBRAKOS are completely reusable. They have uniform locking and installation torques—with no galling or seizing on mating threads. They successfully withstand temperatures from —70° to 250°F. And, on properly seated screws, the pellet acts as a liquid seal.

Self-locking UNBRAKO socket screws come in a complete range of standard sizes and materials. See your authorized industrial distributor. Technical data and specifications are detailed in Bulletin 2193. Write us for your copy today. Unbrako Socket Screw Division, STANDARD PRESSED STEEL CO., Jenkintown 33, Pa.

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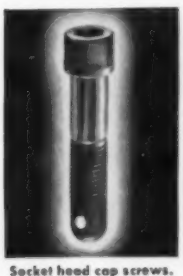
UNBRAKO SOCKET SCREW DIVISION

STANDARD PRESSED STEEL CO.

SPS

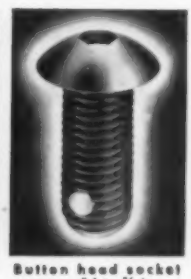
JENKINTOWN PENNSYLVANIA



Socket head cap screws. Standard sizes #6 to 1 in.

Socket shoulder screws. Standard sizes ¼ to ¾ in.

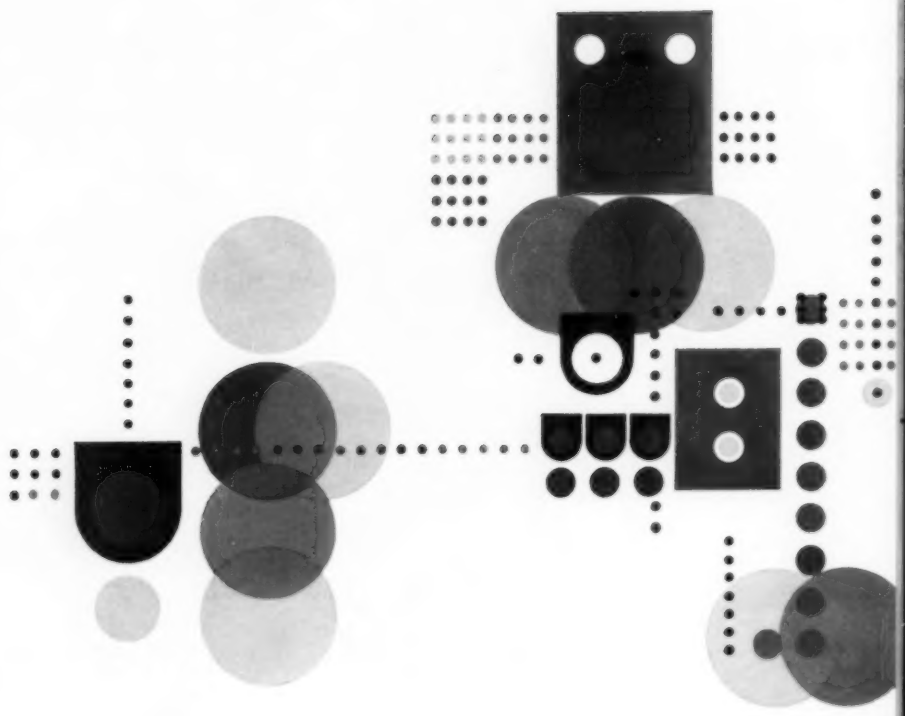
Flat head socket screws. Standard sizes #6 to ⅜ in.



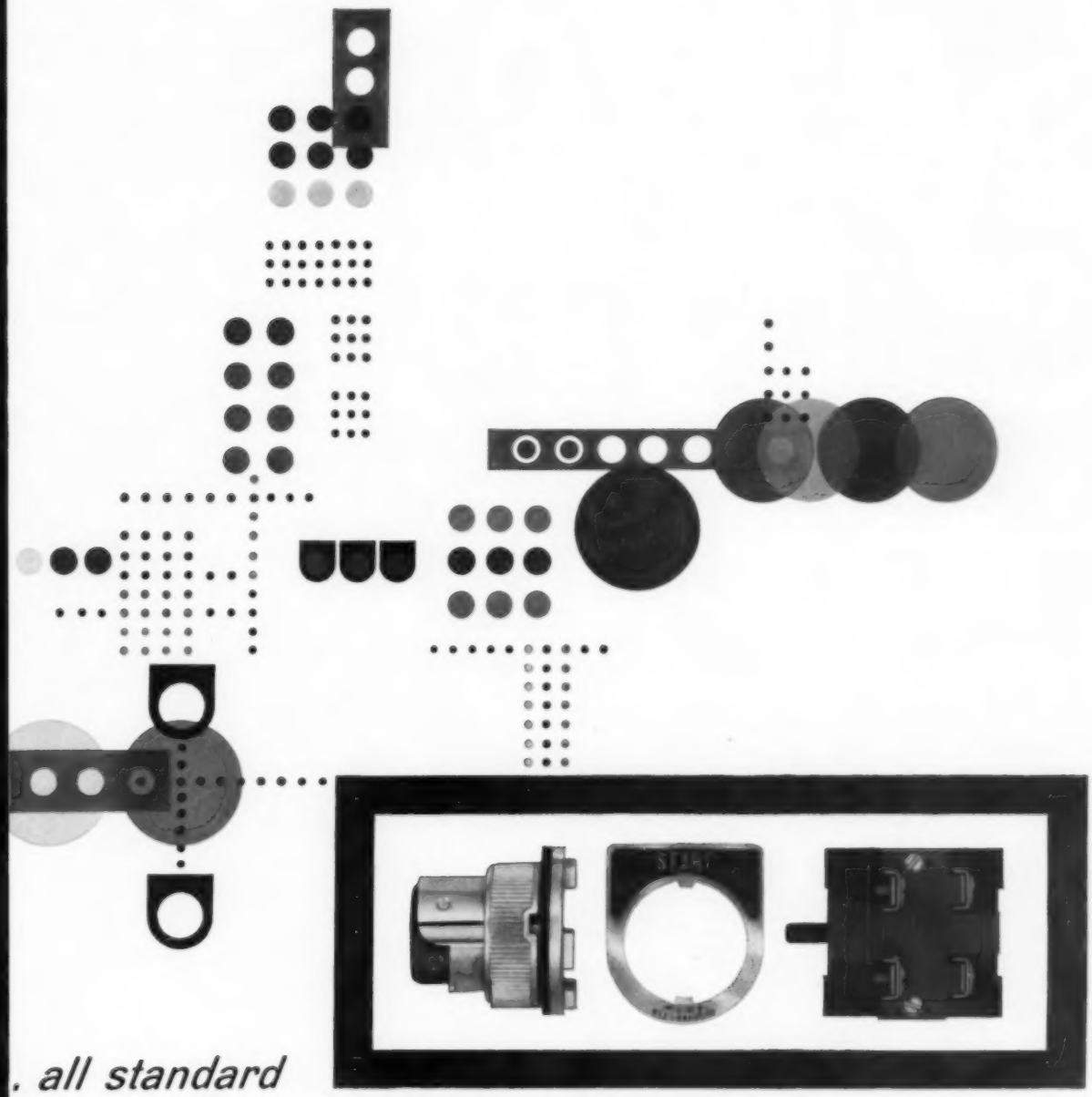
Button head socket screws. #6 to ⅜ in.

Socket pressure plugs. Standard sizes ⅛ to 1¼ in.

Socket set screws. All standard point types. #6 to 1 in.



Pushbutton control arrangements almost to infinity



. all standard

How'd you like a stock of 1,500,000 pushbutton controls on hand at all times for original equipment needs or for production purposes?

Sound prohibitive space-wise, or too expensive? Not at all. Just 38 Westinghouse components (shown above) do it because all parts are standardized and interchangeable. And always available from stock.

If you need controls for any application, write for the free 72-page *Pushbutton Guide*, B-6749. For control where moisture is a problem, write for free Booklet, B-7022, about Oil-Tite* controls. Write to Westinghouse Electric Corporation, Box 868, Pittsburgh 30, Pa. Or call your Westinghouse Distributor.

*T. M.

J-30248

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Westinghouse

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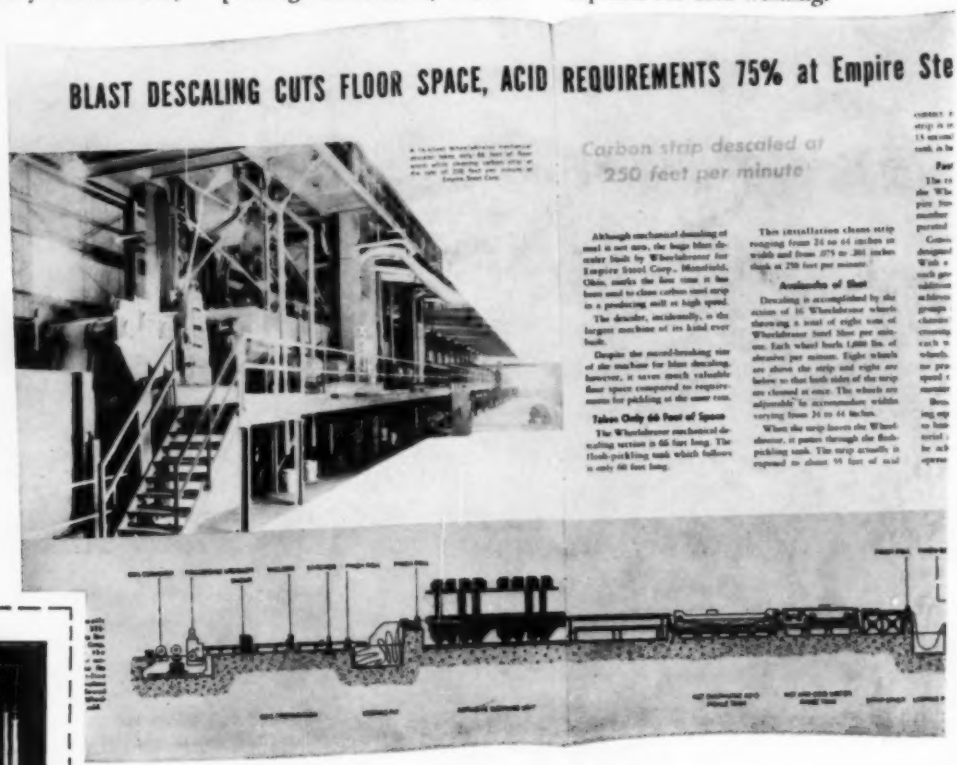
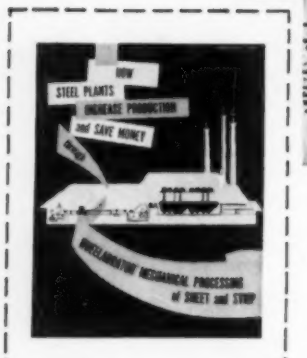
descaling strip and sheet steel

Steel producers and processors are rapidly discovering how Wheelabrator Mechanical Descaling brings savings in time, labor, space and material and results in improved final products. In many installations, mechanical descaling requires only ¼ as much space as acid pickling. In others, labor requirements are reduced as much as 50%. In still others, Wheelabrating saves not only cleaning time but speeds production by permitting straight-line operation not possible with acid pickling. In addition, Wheelabrating removes no virgin metal, thus saving metal. And elimination or reduction of acid pickling saves on acid requirements and minimizes acid disposal problems and expense. While making all these savings, Wheelabrating also provides a matte finish that has proved superior for cold working.


BLAST DESCALING CUTS FLOOR SPACE, ACID REQUIREMENTS 75% at Empire Ste

Carbon strip descaled at 250 feet per minute



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. . . especially merits your careful investigation if you are interested in superior uniformity of PHYSICALS. This wire amazes the Spring Manufacturer when he tries it on his most difficult jobs.

A trial order will convince you.

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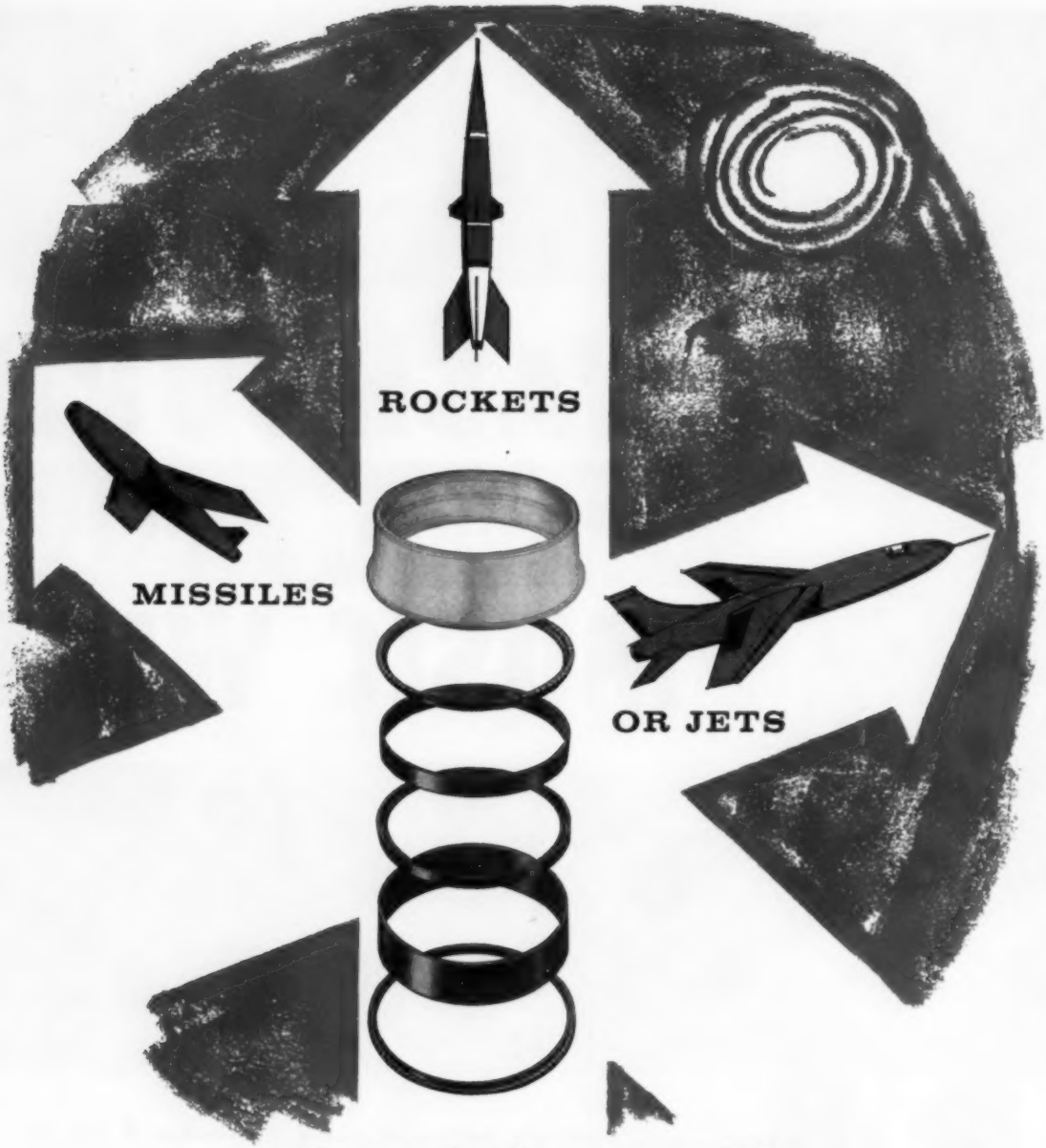

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AMWELD®

The manufacture of today's supersonic jets, missiles, and rockets has placed a burden on the prime contractor. He must be concerned with the ability of hundreds of subcontractors to produce components to the rigid quality demanded by aircraft specifications.

American Welding is proud of its record as a supplier of flash-welded rings and components to major United States jet engine manufacturers. Let Amweld's Industrial Products Division study your problem in circular welded components. Your production, too, can be "well on its way with Amweld."

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The World's Leading Manufacturer of Welded Rings

Metalworking Outlook

Campaign Promises

Three-month vacations every five years, substantial wage increases and sharply increased fringe benefits in the steel industry—those are some of the planks in David McDonald's electioneering platform. He and other top officials of the United Steelworkers of America are campaigning this month for re-election in a series of regional meetings, ostensibly to discuss arbitration, job classification and contract provisions. They will be contested in the union's election Feb. 12 by an unprecedented opposition slate led by Don C. Rarick, who has headed the protest against the $2-a-month increase in dues. Odds still favor the incumbents.

New Records in 1957

"The output of our nation's economy should set new records in 1957," predicts Ralph J. Cordiner, General Electric Co. president. The Federal Reserve Board's industrial production index (1947-1949=100) should average 147 or 148 in the next 12 months, compared with 143 in 1956 and 139 in 1955. Metalworking sales should reach $145 billion, compared with $135 billion last year and $128 billion in 1955.

Inventories Stable, but Should Rise

No startling changes in inventory levels have taken place in the last 30 days, report Chicago purchasing agents. Two STEEL surveys of buying plans for the next three months in components and steel, copper and aluminum indicate that most buyers wish to increase stocks moderately.

Forging Shipments Climb

Look for shipments of forgings to reach 2.2 million to 2.4 million tons this year, compared with 2 million in 1956 and 1.7 million in 1955. Charles H. Smith Jr., president of Drop Forging Association and Steel Improvement & Forge Co., Cleveland, points that the demand for forgings by makers of aircraft and construction equipment is likely to remain strong or increase. The industry expects a revival in the farm equipment market, and the auto industry should prove a larger consumer than in 1956.

Picture Darkens for TV Sets

Makers of television receivers are slowing production in the wake of a slump in Christmas sales. GE's Syracuse setmaking operation will close for a week beginning Jan. 21. Radio Corp. of America has curtailed production at Bloomington, Ind., and Philco Corp.'s production lines suspended for a week at the turn of the year. Just before Christmas, some 2.7 million sets, nearly one-third of total 1956 output, were still unsold.

$12 Billion Yearly for Equipment

American industry needs to spend $12 billion a year on capital equipment to keep up to date, increase productivity at least 1.5 per cent per year and

provide jobs for the 400,000 or more new workers who join the country's production force annually. So says James C. Kelley, general manager of the American Machine Tool Distributors' Association. Of that total, $1.5 billion is to provide new jobs, $3 billion to boost productivity and $7.5 billion to replace worn or obsolete production equipment. The machine tool industry provides nearly one-twelfth of the total $12 billion.

Red Herring in Tool Deal

A promising deal whereby U.S. machine tool builders would license companies in India to make their equipment may sputter out. The snag: Indians wish to sell some of the American-designed tools to Red China. At least one U.S. builder has dropped negotiations as a result.

Bigger Splash in Shipbuilding

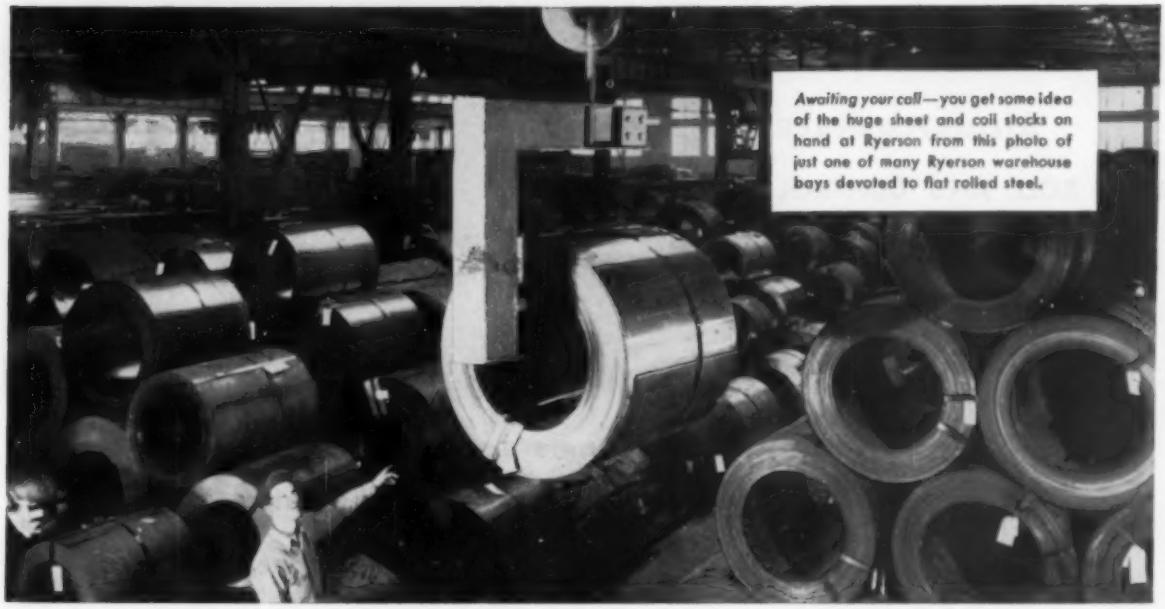
If it weren't for the shortage of steel plates, American shipbuilders could look forward to 1957 as one of their most profitable peacetime years. Some 65 commercial vessels costing more than $1 billion are on the order books. Some 75 per cent of that total booking is for oil tankers, and prospects are that 58 more tankers and two other vessels worth about $715 million will soon be ordered. At least 25 merchant ships should be delivered in 1957, contrasted to ten in 1956.

Lake Ore Boat Transaction Near

Watch for Wilson Transit Co. to consummate a deal soon to acquire Great Lakes Steamship Co. Wilson owns 14 lake boats, one salt water vessel and is building another. Great Lakes owns 16 lake boats. The deal would make Wilson one of the major ore carriers on the lakes.

Straws in the Wind

DeBeers Diamond Trading Co. has boosted prices of two grades of industrial diamonds 8.5 per cent . . . Use of structural adhesives increased more than 200 per cent in 1956, says Narmco Resins & Coatings Co., Costa Mesa, Calif. . . . A mine in Brazil's Amapa territory in the Amazon jungle has begun shipping manganese ore; a U.S.-Brazilian company which manages the operation, eventually expected to produce 700,000 tons annually, is 49 per cent owned by Bethlehem Steel Co. . . . The Rothschild-controlled Rio Tinto Co. and Cyrus Eaton interests of Cleveland are considering Newfoundland as a transshipment point for Ungava iron ore, says Premier Joseph Smallwood . . . Bethlehem and Youngstown Sheet & Tube Co. filed denials Jan. 3 that their proposed merger would violate Section 7 of the Clayton Act.



Awaiting your call—you get some idea of the huge sheet and coil stocks on hand at Ryerson from this photo of just one of many Ryerson warehouse bays devoted to flat rolled steel.

On sheet and strip requirements...

are YOU getting this 3-point service?

Sheet and strip buyers tell us that three kinds of purchasing help keep them coming back to Ryerson:

1. WIDER SELECTION OF TYPES—More than 20 kinds of sheet and coil stock are on hand in an unusually wide range of gauges—making it easier to get the exact steel needed for any requirement.

2. GREATER PROCESSING CAPACITY—The most extensive cutting and processing facilities in the steel-service industry enable buyers to get quickest service on requirements for special sizes, strip and sketch cutting, blanks, slit coils, edging, or any other processing.

3. HELP ON SHEET AND STRIP PROBLEMS—The large Ryerson staff of sheet and strip specialists gives buyers a valuable source of help in selecting the most satisfactory and economical stock—or in solving any other problem of application and fabrication.

In addition, sheet and strip buyers like the good packaging, the dependable weight and on-schedule delivery that they get from Ryerson—and the convenience of one-order buying of all steel products from the same source. So call your nearby Ryerson plant for 3-way help on sheet and strip needs.

RYERSON STEEL

In stock: Carbon, alloy and stainless steel . . . bars, structurals, plates, sheets, tubing, reinforcing bars, machinery & tools, etc.

Ryerson cut-to-length lines quickly and economically convert coil stock into flat sheets of any measure. Ryerson slitters, edgers and batteries of shears are also ready to work for you.

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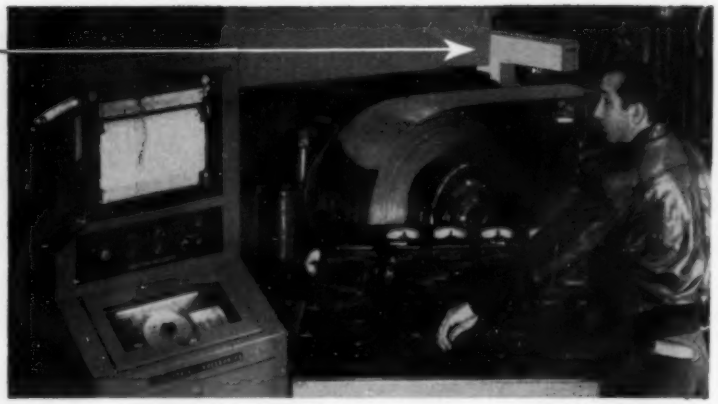
ATOMS-FOR-PEACE HELP ROLL AND CONTROL DSC STRIP



DSC STRIPMANSHIP teams up with *AccuRay*® to give strip users a new high in gauge reliability

ACCURAY AT WORK

AccuRay electronic gauge controls are working on one of our Detroit Plant 4-Hi reversing strip mills. The other 4-Hi at Detroit, also the one at our Eastern Plant (Hamden, Conn.) and the big tandem cold sheet mill at our Portsmouth (Ohio) Division are being similarly equipped.

WHAT ACCURAY IS

AccuRay is the trademark name of a nuclear thickness-measuring instrument made by Industrial Nucleonics Corporation, Columbus, Ohio. It is a peace-time application of principles discovered in atom bomb research.

THE GAUGE

THE RECORDER

**Interested in more about AccuRay gauge control . . . or about any DSC service? Just call your nearest DSC Customer "Rep"*

WHAT ACCURAY DOES

This gauge measures, records and controls the thickness of steel as well as other materials. It does this continuously and automatically while the product is being made . . . and without touching it.

HOW ACCURAY WORKS*

The gauge combines within itself a Strontium 90 radio-isotope (electron emitter) and an electron detector. The strip runs between the isotope and the detector without touching either.

The detector "counts" the electrons passing through the moving strip. The fact that the number of the electrons varies in proportion to the strip thickness is the basis for measuring the thickness.

The detector transmits these thickness variations to a recorder which visibly traces them on a chart in split thousandths of an inch. It also "feeds back" this "information" to electronic controllers which operate the roll screw-down motors on the mill. These motors open and close the rolls to decrease or increase their squeeze on the strip . . . thereby continuously "correcting" the gauge within specified tolerance limits.

WHAT ELECTRONIC CONTROL MEANS TO DSC STRIP USERS

Gauge consistency, within standard or restricted tolerances, is characteristic of DSC STRIP. That, together with job-suited temper and finish, accounts for consistently good performance records . . . even without AccuRay control.

Now AccuRay controls make possible even greater gauge reliability. Users will profit from smoother, steadier, faster production, longer tool and die life, lower end-product costs.

Customer Satisfaction Is Our Business

DSC MILL PRODUCTS, PORTSMOUTH DIVISION, PORTSMOUTH, O.

Hot Rolled and Cold Rolled Sheets • Low and Medium Carbon Manufacturers' Wire • High Carbon Specialty Wire • Aluminum Cable Strand Reinforcement • Rope Wire • Tire Bead Wire • Welded Wire Fabric

DETROIT MILL DIVISION, DETROIT, MICH.
EASTERN MILL DIVISION, HAMDEN, CONN.

Cold Rolled Carbon Steel Strip
Flat Cold Rolled Carbon Spring Steel

DETROIT DSC STEEL

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Growing by Plan

Decision by the Office of Defense Mobilization not to allow fast tax amortization for steel expansion was disappointing to producers who had filed applications covering $2.3 billion in new projects. Coinciding with a tighter money policy, the denial of tax aid threatened to jeopardize the industry's expansion program.

The editors of this magazine asked the heads of all companies that had applied for accelerated amortization what would happen to their expansion programs. The producers answered that only 4 per cent of the projected expansions would be canceled, that some projects would go forward at a slower pace, but that the bulk of expansion would proceed on schedule.

We believe the decision by steelmakers to go ahead is an act of statesmanship. The projected expansions are part of a long-range plan, based on searching studies of future needs, to provide adequate supplies of steel in times of emergency and in times of peace. The construction of steel facilities takes a long time. To provide for the needs of the 1960s means building now.

We further believe the decision will contribute to the efforts of the steel, and other capital goods industries, to lick their cyclical problem. Too often in the past, the capital goods industries have waited until an emergency or boom existed before building. Then they had to compete with everyone for scarce materials, manpower and equipment, costs were higher, plans were imperfect and often the resulting facilities did not fit into any long-range plan. Such lack of planning contributed to the feast or famine operation of the industry. It resulted in high peaks and low valleys in production and employment.

Industrial history is full of good and bad examples. Railroads traditionally have held equipment purchases to a minimum during the leaner years. When the fat years come, they step up equipment ordering only to find materials and manpower scarce and suppliers unable to deliver all they want when they want it. Both the railroads and their customers have suffered as a result.

Builders of machine tools and other industrial equipment, as well as the steel mills, were victims of the same attitude. During lean times they could beat the industrial bushes and sell only a fraction of what they could produce. Comes an emergency, their backlogs pile up, buyers can't get delivery. Result: Bottlenecks in production.

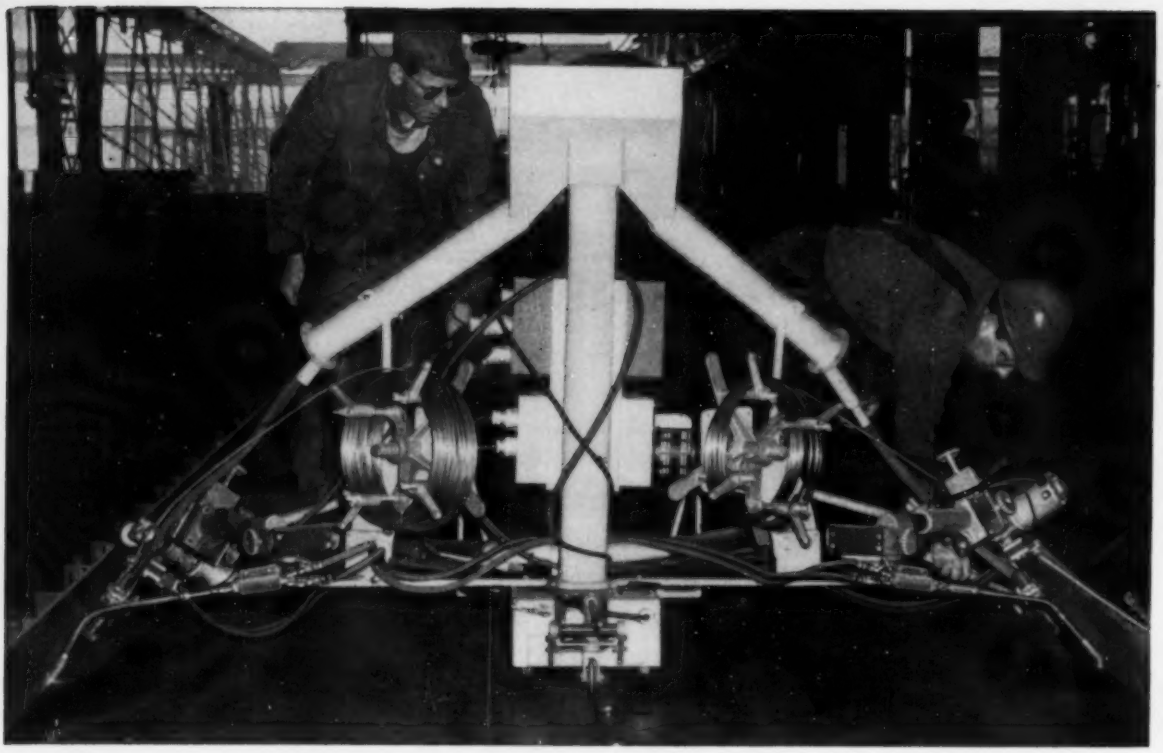
By contrast, look at the electric power industry. By estimating carefully for years in advance the requirements of their customers, the power industry generally has been prepared to meet high demand when it occurred, and at the same time avoid expensive excess capacity.

The projects the steel industry is carrying forward now are part of a program that includes short-range projects, medium-range and long-range expansion. The programs are based on careful studies of the nation's future needs.

That they will be executed with courage in the face of obstacles provides an object lesson for other industries.

Walter J Campbell

EDITOR



UNIONMELT welding simplifies and speeds fabrication of giant steel beams.

two heads are better than one

PARTICULARLY WHEN THEY'RE "UNIONMELT" WELDING HEADS

Mounted on a single LINDE machine carriage with a common composition hopper, dual UNIONMELT welding heads enable fabricators of steel beams to—double production speed, produce premium quality welds, and cut equipment costs.

In this highly efficient installation welding controls are within easy reach of the operator. He can clearly observe welding conditions, and make any amperage or voltage adjustment necessary. Another feature used here is a grooved, magnetic track which provides a sure course for the carriage guide wheel to travel as welding heads move over their work . . . Welding is fast, and operations are simple.

UNIONMELT Welding Features

Extreme depth of penetration—the ability to make welds up to 1½ inches thick in a single pass—plus high welding speeds make UNIONMELT welding the most economical process for a wide range of fabricating and repair jobs. Equipment is available in both portable manual machine, and automatic machine installations.

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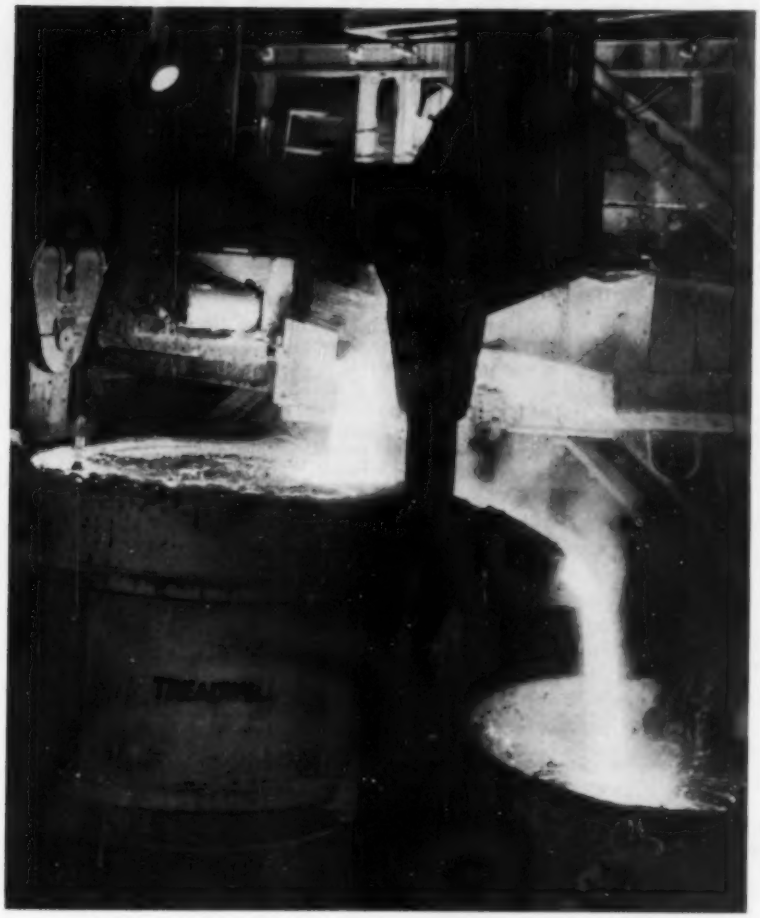


Pittsburgh Steel Co.

Steel Expansions Go Ahead

THE U.S. refusal to grant fast tax amortization for steel industry expansion will have three major results:

1. Less than $100 million worth of projects will be canceled.

2. But much of the $2.2 billion that will proceed will go ahead at later dates than if the tax aid had been granted.

3. And the search for additional capital will be more difficult than ever.

So 24 steel producers which had sought five-year write-offs told STEEL.

Abandoned — Bulk of the $100 million that probably will be dropped is a program by one company which asked STEEL for anonymity. It still is hunting for capital and won't definitely announce cancellation until it has exhausted all possibilities.

Companies such as Bethlehem, Youngstown, J&L and others (see page 38) are still studying their situations. They may cancel part of their projects, but the odds favor that they'll ultimately go ahead with everything. Barium, for example, makes that pledge in connection with the proposal for a Delaware Valley mill.

Delayed—The Washington action will mean new time schedules for the expansion plans of many companies—Alan Wood, Crucible, Detroit, U.S Steel. But many others will go ahead with little or no changes in timing—Acme, Allegheny Ludlum, Armco, Granite City, Inland, Lone Star, Lukens, National, Pittsburgh, Porter, Republic and Sharon.

Despite the delays, look for more than 15 million ingot tons of additional capacity by 1958 or early 1959. It's likely that the industry's plans will continue to grow beyond the 143-million-ton total projected by the end of 1958, compared with the official capacity of 133.5 million tons now.

Search for Capital—Here's the big rub. Even the blue chip companies are experiencing some troubles with the tight money market.

Even if you can get the money by borrowing, the rising interest rates make some firms shy away.

New stock issues are in the cards. Lukens has authorized a stock split, one purpose of which will be to raise money by stock sales. Armco also will offer new stock that will be allocated to existing stockholders.

More price increases are likely as a means to get money. The present round of boosts in extras is one indication that such a move will be one approach.

Look for more financing by customers. Even some of the largest producers have done this in the past. More will in the future. Lukens reports a $15-million loan offer from General Electric Co., one of its big customers for plates. J&L may take that way out in financing the Houston mill.

The industry wants better depreciation allowances and amortization on the basis of replacement, not original costs. In effect, it would have won better allowances if five-year amortization had been granted. Normally, the 1954 Internal Revenue Code allows about two-thirds of the cost of an asset to be written off in the first half of its life. That's too slow, say steelmen. But chances for reform

What 24 Steel Firms Will Do About Expansion—With No Tax Aid

ACME STEEL CO.: Its $15.5-million program for steel making and rolling facilities will be unchanged. Completion date is the end of 1958.

ALAN WOOD STEEL CO.: Its $7-million proposed expansions of pig iron, ingot and powdered iron facilities will be delayed. The extent is as yet undetermined.

ALLEGHENY LUDLUM STEEL CORP.: Its $8-million program will be unaffected. Projects at Dunkirk, N. Y., Brackenridge, Pa., West Leechburg, Pa., and Detroit will be completed in 1957.

ARMCO STEEL CORP.: $186.8-million worth of expansion in steelmaking and processing facilities at Ashland, Ky., Butler, Pa., Houston, and Middletown, O., will proceed on schedule.

BARIUM STEEL CORP.: Ultimately it will go ahead with its Delaware Valley project, but the date is uncertain. Most of the $134 million it had on file for fast tax amortization was for the Delaware project; the remainder will go for improvements at Harrisburg and Phoenixville, Pa.

BETHLEHEM STEEL CORP.: The company is studying what to do about nearly $444 million in proposed expansions, principally at Lackawanna, N. Y., Steelton, Pa., and Seattle. Odds are that the projects will go ahead, but on a new time schedule.

COLORADO FUEL & IRON CORP.: It will review its $33.2-million program proposed for Claymont, Del.

CRUCIBLE STEEL CO. OF AMERICA: A $12.5-million program to expand stainless facilities at Midland, Pa., will be completed in 1957. Some $49.5 million in other projects also at Midland will be restudied.

DETROIT STEEL CORP.: It will indefinitely postpone $14.6 million of $16.5 million in applications. It will continue with plans to build a $1.9-million open hearth at Portsmouth, O., to be completed in mid-1957. In addition, it will go ahead with a $1.1-million welded wire fabric machine installation.

GRANITE CITY STEEL CO.: Some $150 million worth of steelmaking and auxiliary facilities will be completed in the St. Louis area after 1960.

INLAND STEEL CO.: It is well under way on a $150-million program, including three new open hearths, new facilities for expanding hot strip mill output, new facilities for increasing blast furnace production, installation of a new slabbing mill and slab yard and installation of a new cold-rolled sheet department.

JONES & LAUGHLIN STEEL CORP.: It's reviewing its proposal to build a $250-million tubing mill at Houston.

KAISER STEEL CORP.: It hopes to go ahead with even more extensive expansions than indicated in its application for $65 million in tax aid, provided capital can be obtained. Major projects include a fourth blast furnace and another oxygen converter.

LATROBE STEEL CO.: It will proceed on schedule with a $2-million expansion in the Pittsburgh area, but will postpone another $2-million project.

LONE STAR STEEL CO.: Open hearth and stretch reducing mill facilities costing $7.8 million will be completed in 1958, as originally scheduled.

LUKENS STEEL CO.: It will go ahead as planned with a $40-million program, comprising two electric furnaces and related facilities. The projects will be finished two years from their start which Lukens hopes will be this year.

MCLOUTH STEEL CORP.: It had $100.3 million in applications on file for fast tax amortization. The company is studying the situation.

NATIONAL STEEL CORP.: It's going ahead as planned with $71.5 million in expansions, including $52.6 million for Great Lakes Steel Corp. (coke ovens, sinter plant, slab heating furnaces, dock facilities, power and transportation equipment) and $18.9 million for Weirton Steel Co. (sintering plant, soaking pits, slitting line, storage building).

PITTSBURGH STEEL CO.: It's going ahead as planned with $10 million in expansions scheduled for completion at the end of 1957 or early 1958. Projects include a new 30-in. billet mill and renovation of the 18-in. mill at Monessen, Pa., and improvement and expansion of electroplating facilities of its Thomas Strip Division at Warren, O.

H. K. PORTER COMPANY INC.: No change is contemplated in expansion plans. The firm had filed for nearly $4 million in tax aid to expand and improve ingot and finishing facilities at Huntington, W. Va.

REPUBLIC STEEL CORP.: "No effect on our plans whatsoever." Its current expansion program will cost $187 million (see following page).

SHARON STEEL CORP.: About $23 million in expansions will proceed. An $8.5-million electric furnace project will be started this month or next and a $14.5-million blooming mill will be completed in February.

U.S. STEEL CORP.: "Everything announced (nearly $460 million worth) will go ahead, but probably not as rapidly as if fast tax write-offs had been granted."

YOUNGSTOWN SHEET & TUBE CO.: It will go ahead as planned with a $36.8-million program at Youngstown (seamless stretch press, coke plant and other facilities) and a $10.5-million expansion at Indiana Harbor, Ind. (billet heating and slab heating furnaces).

by the 85th Congress are exceedingly slight.

U.S. Steel echoes industry sentiment on depreciation: "The solution lies in the need for a revision of depreciation allowances. Need for such revision is rooted in growing inflation. Under the present law, business is allowed depreciation for only the number of dollars originally invested in a facility regardless of the decline in the dollar's buying power. When it becomes necessary to replace such a facility, we find that inflation has increased equipment costs several times over the cost of years ago."

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, O.*

Republic Expands at Gadsden

A second electric furnace will be added to boost the plant's steelmaking capacity to 1,197,000 tons annually. The first electric will start producing in May

REPUBLIC Steel Corp. is doubling expansion of its steel melting capacity at Gadsden, Ala.

This doubling will be achieved through addition of a second electric steelmaking furnace. This additional furnace will have an annual capacity of 204,000 net tons—the same as the one electric furnace announced in original plans for expansion. Both electric furnaces will be housed in a building now under construction.

Fifty Per Cent Increase — The two electrics will give an annual capacity of 408,000 net tons and will supplement the 789,000 tons of capacity of the Gadsden plant's eight open-hearth steelmaking furnaces. The plant's total steelmaking capacity will then be 1,197,000 net tons a year. The first electric is expected to start in May.

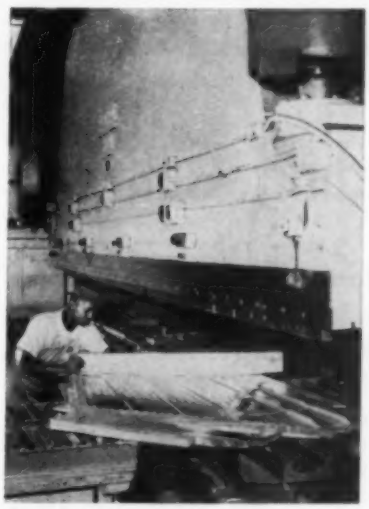
Confident—The second electric furnace, to start producing late this year, is being added because of Republic's expectations of an increased rate of growth in demand for steel in the South. The addition of steelmaking capacity is linked with installation of new and expanded facilities for producing light, flat-rolled finished steel. When the new strip mill was announced originally for Gadsden (52 miles northeast of Birmingham), Republic referred to an initial monthly production from that mill of around 22,000 tons but noted that the capacity would be considerably more than that. Steel from the additional electric furnace will enable the Gadsden plant to turn out 35,000 tons of finished flat-rolled steel a month.

Expanded Expansion—Addition of the second electric furnace will require further expansion of certain auxiliary facilities. They include: A second slab heating furnace for the plate mill; two more blocks of soaking pits; an increase in area of the sheet finishing and shipping departments; addition to the machine shop building and installation of more machine tools; addition to the electric shop building; addition to the maintenance superintendent's office building; an extension to the new roll shop; a scale-breaker and scale flushing system for the plate mill; additional railroad trackage, roadways, fire protection equipment, and utilities.

The new, continuous strip mill is to start producing in mid-1957. Until now, the Gadsden plant used hand mills to produce light, flat steel. It did not produce cold-rolled sheets. The new, continuous equipment will turn out hot-rolled and cold-rolled sheets in coils or cut lengths. Galvanizing pots will be replaced with a continuous galvanizing line.

More Products — Most of the Gadsden mill's output of light, flat steel has been going into galvanized sheets. Other products of the plant have been principally hot-rolled bars, wire and large diameter electrically welded line pipe. Addition of continuous hot-rolled and cold-rolled sheets broadens the plant's product line.

Expansion of the Gadsden plant is part of Republic Steel's program to boost its annual steelmaking capacity by late this year to 12,242,000, an increase of 1,980,000 tons. Expansions are under way at Chicago, Cleveland and Warren, O., in addition to Gadsden and several other points.



Wing Straightener

This hydraulic press brake provides the accuracy necessary for straightening sculptured wings of supersonic planes at North American Aviation Inc., Los Angeles. Built by Pacific Industrial Mfg. Co., Oakland, Calif., the brake operates on the air bending principle

Scovill To Build Tube Mill

A 200 x 1150 ft building is planned for a 93-acre site Scovill Mfg. Co., Waterbury, Conn., purchased at New Milford, Conn. Construction will start this spring.

Tube drawing, annealing and related processing operations will be performed at the new plant. About 200 persons will be employed when operations start.

Timken Expands Tube Mill

Seamless tubing up to 40 ft long can be made in Timken Roller Bearing Co.'s Canton, O., tube mill. The No. 2 piercing mill was renovated and modernized as a part of a $1¼-million program.

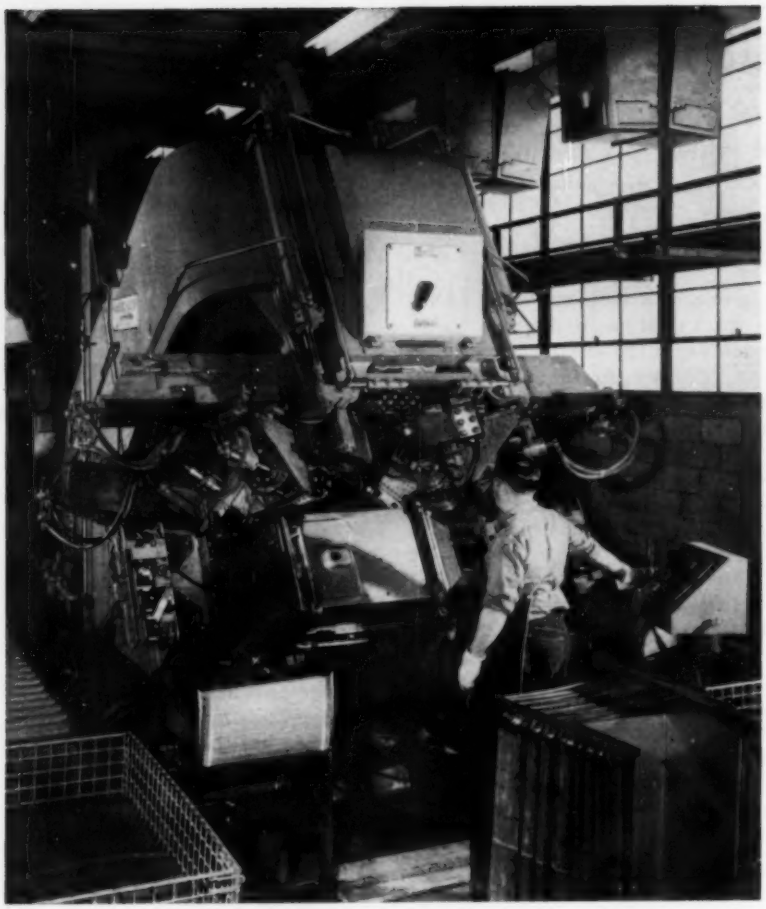
A storage building, a rotary sizing mill, cooling and reheat furnaces and installation of industrial television control systems were included in the program.

American Machine Picks Site

A $1-million plant will be built for the Midwest division of H & B American Machine Co. Inc. at Indianapolis. Employment is expected to increase by 150. Completion is scheduled for June.

Standard Pressed Steel Grows

A $1.4-million addition is being made to the Hallowell Steel Shop Equipment Division of Standard Pressed Steel Co., Jenkintown, Pa. Factory space will be increased by 80,000 sq ft. New machinery will cost about $500,000.



Westinghouse Electric Corp. spot welds cabinets using Resistance Welder Corp. machine

Resistance Welding Gains

Orders jumped 37.6 per cent last year. Automation spurs sales as builders are called upon to construct equipment into lines that combine other operations with resistance welding

SALES of electrical resistance welding machines were at an all-time high last year. Good business is expected this year, although the pace may be slightly below 1956's.

Sales Roundup—The Resistance Welder Manufacturers' Association, Philadelphia, representing 18 company members, reports that orders in the first 11 months of 1956 aggregated $45.2 million, compared with $32.8 million in the corresponding period of 1955 — a thumping 37.6 per cent increase. When these figures are augmented by sales of Sciaky Bros. Inc., Chicago, a major producer, and a half dozen other companies that are not association members, the magnitude of the resistance welder field is apparent.

Some companies registered sales gains of as much as 60 to 80 per cent last year.

Two factors stand out in the 1956 record-breaking performance. One was the tremendous retooling program of the automobile industry for its 1957 models. The other: Automation in the metalworking industry.

Automation — The part which automation is playing is singled out by Federal Machine & Welder Co. and Taylor-Winfield Corp., both of Warren, O., and Progressive Welder Sales Co., Pontiac, Mich. More and more, they point out, the builder of welding machines is being called upon to build equipment and production lines which combine other metalworking operations with resistance welding.

In connection with this trend, leading welder manufacturers are designing machines which are comparable to machine tools in quality. More of this is certain for the future. With the automation trend comes the necessity of building larger machines. Resistance Welder Corp., Bay City, Mich., has found the demand for bigger machines so persistent that it is building a manufacturing building that will quadruple its assembly facilities.

Education — David V. Uihlein, president, Banner Welder Inc., Milwaukee, and president of the Resistance Welder Manufacturers' Association, believes that some sales gains stem from acceptance built up through educational and research activities. The future, Mr. Uihlein believes, will see such activities greatly extended.

Sciaky Bros. Inc. emphasizes that the future of the industry depends upon selling the "safety" of resistance welding. The company believes the industry must recognize and sell the integrity of each individual weld to users.

In the past, quantities of resistance welds sometimes have been used without great regard for the quality of any one of them. This, the company points out, can no longer be the case. Each weld must be perfect. Resistance welding will increase when the user is convinced the integrity of the method will satisfy the most rigid requirements.

Biggest users include automotive, appliances, aircraft, agricultural implements, steelmaking, metal furniture and electrical manufacturing.

Sylvania Electric Products Inc.

Power transistors for automobile radios are placed in a vacuum bake oven

Transistor Market 'Boundless'

SOME 3.6 million transistor units were shipped in 1955. Industry spokesmen are estimating that last year's shipments will total 12 million units (see table).

Minneapolis-Honeywell Regulator Co.'s transistor division sums up the industry's confidence in '57: "Our problem is going to be concerned with making enough to meet demand."

Prices—Texas Instruments Inc.'s 1961 estimate (175 million units for $150 million in sales) points out the nose dive prices are expected to take as demand and automation techniques combine to bring the unit price on many models below $1.

General Electric Co. has already announced a price drop this year. Effective Jan. 1, GE slashed the price on 15 models (used in portable radios, phonographs, high fidelity equipment and various amplifiers) 9 to 17 per cent. This brings its average price for entertainment transistors to about $1.25 each—46 per cent less than the average in the corresponding period a year ago.

Advantages — Compared with vacuum tubes, transistors are more reliable, lighter, smaller, have lower power requirements and less heat dissipation.

But transistor technology must keep growing. Reports Radio Corp. of America: "We are all under pressure to improve performance, lower prices. Some electronic equipment needs units which will operate beyond present transistor capacities. This continually helps create new markets and demands for our product."

Growing Pains — One problem, explains Minneapolis-Honeywell, is that the industry must convince consumers that transistors can be used successfully over extended periods.

Computers — Business machines are a mushrooming market for transistors. Remington Rand Univac Division, Sperry Rand Corp., says: "Scientists have finally achieved the high reliability from the transistor that it failed to exhibit earlier. Recently developed transistor types are far more reliable than vacuum tubes." Adds International Business Machines Corp.: "Transistors have several advantages in computer applications. They can handle much higher frequencies than vacuum tubes. Transistors have already been developed which can handle up to 10 million impulses per second."

Kinds — Germanium transistors are being made by most producers. Texas Instruments and Raytheon Mfg. Co. make germanium and silicon transistors. Other manufacturers are experimenting with pilot runs of silicon transistors. Advantage of silicon units: They can operate at temperatures about two times higher than germanium types, contends Texas Instruments.

Salesmen — Reports Sylvania Electric Products Co.: "Our transistor salesmen must be applications engineers. They must be able to see where transistors can be used effectively as well as assist with the engineering know-how."

Markets are boundless, contends the industry. Says one spokesman: "Our optimistic future estimates are based on the thought that transistors can be used in everything from the largest computers to mechanical toys."

Commercial Atomics Hits Stride in '56

Construction began or contracts were received on 59 new nuclear reactors:

30 reactors for research and test purposes
(14 for export; nine for the federal government; seven for private U. S. buyers)

29 powertype reactors
(14 for the Navy; six demonstrators for private U. S. buyers; four prototypes for the Atomic Energy Commission; four for export; one for a merchant vessel)

Work was carried forward on the construction of 17 reactors:

14 powertype reactors
(Seven for the Navy; four for private U. S. buyers; three for the federal government)

Three for research and test purposes
(Two for the AEC; one for a university)

Construction was completed on two reactors for research:

(One for Armour Research Foundation, Chicago; one for Battelle Memorial Institute, Columbus, O.)

Source: Atomic Industrial Forum Inc., New York

Who's Who in Atomics

DURING 1956, private U.S. industry leaped into the field of atomic power with both feet (see above). The Atomic Industrial Forum Inc., New York, provides the score card:

New Look—Last year, industry began to build reactors for its own use for the first time.

Bendix Aviation Corp. contracted to build a research reactor for Ford Motor Co.; Daystrom Inc. for Curtiss-Wright Corp.; Dow Chemical Co. and General Dynamics Corp. for their own use.

Nuclear Aircraft—Of the nine research reactors contracted for by the government, eight are for the nuclear powered aircraft program. ACF Industries Inc. will build one for the Air Force's Wright Air Development Center. The other seven will be built for industry: General Electric Co. will build two reactors for Lockheed Aircraft Corp. and two for its own use; Bell Laboratories, General Dynamics and Pratt & Whitney Co. Inc. will build one each for their own use.

The aircraft program is classified generally, but AIF says other companies are also known to be developing reactors for aircraft propulsion: Curtiss-Wright, Garrett Corp., General Motors Corp. and Nuclear Development Corp. of America.

For the Navy—The 1956 score card of commercial atomics spells out our atomic Navy of the future. Here's how contracts for 14 naval reactors were awarded: GE will build two for a radar picket submarine; Westinghouse Electric Corp., ten for submarines and two for a guided missile cruiser. (Westinghouse also received a contract for initial work on eight reactors for an aircraft carrier.)

Combustion Engineering Inc. and GE began work on new prototypes for submarines; GE continued work on the *Seawolf's* engine; Westinghouse continued work on other prototypes.

Electric Power — These demonstration power plants were contracted: A 22,000-kw reactor for the Rural Cooperative Power Association, Elk River, Minn. (American Machine & Foundry Co. will build it); a 10,000-kw reactor for Wolverine Electric Cooperative, Hersey, Mich. (Foster Wheeler Corp.); a 12,500-kw reactor for Piqua, O. (North American Aviation Inc.); a 10,000-kw reactor for Chugach Electric Association, Anchorage, Alaska (Nuclear Development Corp.); a 134,000-kw reactor for Yankee Atomic Electric Co., Rowe, Mass. (Westinghouse). GE began construction of its own demonstrator (5000 kw) at Livermore, Calif.

Foreign Sales — Atomic power around the world promises to have a made-in-America stamp. GE contracted to build two 10,000-kw reactors for subsidiaries of American & Foreign Power Co. operating in Latin America; Glenn L. Martin Co., a 12,000-kw reactor for the Dominican Republic; North American, a 10,000-kw reactor for a Latin American subsidiary of American & Foreign Power. Those contracts are contingent upon negotiations of bilateral agreements between the U.S. and the nations involved.

Profits Provide for SUB

Profit sharing has solved fringe benefit problems of many small and medium size companies. Is it the answer to financing Supplementary Unemployment Benefits, too?

FINANCING SUB—as well as the expanding fringe benefits—is still a major hurdle for the small and medium size company.

When you're strapped with fixed costs, what do you do when the business bubble goes soft? This concern is focusing more interest in tying benefits to profits.

Example—Leeds & Northrup Co., Philadelphia. Its first unemployment benefit plan dates back to 1923. "We financed it from profits then, too," relates R. W. Johnson, personnel manager.

L&N revived its unemployment plan in the early 1940s. To build up the benefit fund, the company contributed $50,000 in 1940 and $100,000 in each of the next three years. Nothing was contributed in 1944, and starting in 1945, its contributions to maintain the fund were fixed at 2 per cent of available net earnings.

As of June 1, 1956, the L&N unemployment benefit fund totaled $958,977, an average of about $320 for each of its 3000 employees.

Good Times—"The philosophy behind financing an unemployment benefit fund from profits," says J. C. Hess Jr., vice president-industrial relations, "is to build the fund during good years when profits are high. Then in the lean years, there's both protection for the employee who might be laid off and the company which might not be able to maintain a high fixed-cost contribution." L&N also has a provision in the agreement under which no payment by the company is made if payments according to the contribution formula amount to less than $5000.

The contribution formula is based on 2 per cent of net earnings (before taxes) less an earnings factor for stockholders. The company is revamping its earnings-for-stockholders factor because its stock structure was changed recently.

Annual Share—This is the way fund earnings and company contributions are credited to each individual's account:

1. At the end of each fiscal year, the amount of appreciation or depreciation of the fund is prorated to each account.

2. Company contribution is distributed: First, into the account of each new member is credited a sum equal to twice his weekly earnings (disregarding any amounts in excess of $69.60 a week). The balance is then prorated to all accounts.

Membership in L&N's unemployment benefit plan is opened at the end of each fiscal year when the company contributions are made and individual accounts adjusted. All new employees are then made members and their individual accounts set up.

Pay Off—1. Members receive full amounts in their individual accounts upon retirement, 65 or older. In the event of death before retirement, beneficiary receives full amount in the account.

2. Members with at least six months' service and dependents are entitled to weekly payments of 70 per cent of weekly earnings or $45.60, whichever is the lesser, diminished by any state unemployment compensation. L&N officials state that the $45.60 figure will probably be revised upward this year. Members without dependents get only 50 per cent of weekly earnings or $32.40, whichever is lesser.

3. Members with at least six months' service are entitled to payments when the workweek is reduced to below 80 per cent of normal. Formula for payments to members with dependents: 70 per cent of 80 per cent of normal workweek, minus actual hours worked, times the individual's base hourly rate. Without dependents, the 70 per cent becomes 50 per cent.

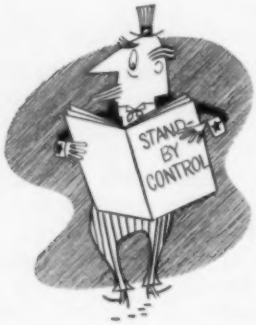
Separation—1. Employees with at least four years' service are entitled to the full amount in their account upon separation from the company — except for dismissals for dishonesty, insubordination and other misconduct.

If transferred because of a lack of work to another job where the base rate or weekly salary is lower, members are entitled to payments. The formula: With dependents, 70 per cent of base weekly earnings (not exceeding $69.60), minus base weekly earnings of the new job. Without dependents, the 70 per cent becomes 50 per cent.

L&N's SUB Fund in Operation

	Contributions from:		Payments because of:				
Year	Company	Fund Earnings	Layoff	Reduction in Rate	Reduction in Hours	Death or Retirement	Separation
1956	$60,542	$60,663	$ 175	$ 218	$ —	$16,028	$25,791
1955	30,136	55,777	12,155	5,951	1,058	9,979	11,792
1954	48,355	62,961	287	1,469	—	6,664	10,253
1953	83,956	13,382	—	509	—	6,939	12,699
1952	114,922	15,701	—	—	—	5,733	11,936
1951	72,443	8,889	15	285	—	3,359	10,988
1950	18,796	11,056	8,839	2,879	7,000	2,885	8,496

Stand-by Controls? Not Likely



TALK ABOUT stand-by emergency controls on prices, wages and materials remains at a low ebb in Washington in spite of President Eisenhower's request to Congress for stand-by authority to send troops into the Middle East. Reports are that there has been no step-up in activity among the few skeleton government crews who have been studying on a long-term basis the alternatives that would be available should such action eventually be approved. For that reason it looks like the administration will continue its present strong opposition to anything that smacks of a government-regulated economy, even on a stand-by basis.

WOC Program Achieves Only Half of Goal

Business & Defense Services Administration's WOC program (under it, executives are given leave by their companies to work for the U.S. without compensation from the government) seems to be accomplishing only half its objectives. The two-fold purposes of the program: 1. Industry officials with their first-hand knowledge of business keep government people informed of current industry developments. 2. The executives form a nucleus of trained administrators who will know the ins and outs of what the government would expect from their industry under national emergency conditions. BDSA officials publicly have mostly praise for the program; privately they have other views. Chief complaint is that industry is sending too many men who are near or at retirement age.

Rash Coming on Bills Affecting Business

The advance guard of an expected rash of Congressional bills affecting business has already arrived. Included are proposals to adjust corporate tax rates so they'll be more favorable to small business (by, in effect, reversing the present structure of a 30 per cent tax on income to $25,000 with 22 per cent surtax on income to cover that amount). Another: To put the government into the atomic power business with a $400 million program. It's likely to be several months yet before Congress gets around to studying those bills and others to come.

Highway Program Doing Well

Administration officials are telling Congressional questioners that the big federal highway program is progressing rapidly. Acting federal highway administrator says some materials and equipment shortages are affecting progress in some areas but that improvement is expected. To further speed the program, local Bureau of Public Roads officials are getting more authority.

Curious Metalworking

Metalworking tops industry requests to the Small Business Administration for information on products and processes to diversify and expand business operations. SBA notes 834 requests for information on fabricated metal products, 702 inquiries about machinery patents. Information about new patents available for sale or licensing is given in SBA's products list circular which is available for the asking. Another idea source: Results of government financed scientific research—currently running at $2.7 billion a year—available through Commerce department's Office of Technical Services.

Tabs on Scarce Items

Commerce department wants to set up an accounting system to keep tabs on raw materials that would be scarce in wartime. Results, it's claimed, would give industry a chance to plan in advance, perhaps arrange to substitute for, short supply items. Possible obstacle: Congress has been cool to proposals to expand statistical operations of the department. On the other hand, the request might get through if it can be shown that small business will benefit from knowledge the program would give.

Straws in the Wind

- Bendix Aviation Corp. has a $27-million contract for production of Talos guided missiles.
- Cessna Aircraft Co. got a $5 million-plus Air Force contract for 80 Model 310 aircraft; the purchase is in line with "off the shelf" buying when possible by the services. The 310s will be used for light transport and cargo work.
- Practically all exporters now have to file an antidiversion notice with the Bureau of Foreign Commerce. The move is aimed at cutting down reshipment of U.S. goods from their foreign destinations to unfriendly nations. Prior to this action only about 20 per cent of exports were covered. Shipments to Canada are exempt.

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Bellows cover for sliding ways
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Whether you want a boot two stories high . . . or no bigger than your thumb . . . let C/R Sirvis engineers solve the problem for you. They're specialists . . . backed by 78 years' experience . . . with unusual skills and ingenuity in the development and manufacture of mechanical boots. They'll design and produce a C/R Sirvis boot to your exact requirements in any size, any quantity . . . using only the finest materials: mechanical leather, selected, tanned and treated by C/R . . . nylon . . . or elastomer-coated fabric. The absolute dependability of your boot will be proved before production.

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Push Button Convenience for Spindle Speed Selection

In your home, your workshop, practically everywhere you look push buttons are the ultimate in convenience. Now they perform an important chore in machine tool operation; they select spindle speeds on CINCINNATI® Dial Type Milling Machines at the front and rear operations positions. But convenience is not the only advantage. They also save time and reduce costs. How? In operating a toolroom miller, spindle speeds should be changed as often as the job requires. On CINCINNATI Dial Types, push buttons do it in a few seconds throughout the entire range of 18 to 1800 rpm for the No. 2 Machines, and 16 to 1600 rpm for the Nos. 3 and 4 Machines. And because it's quick and easy, the optimum cutting speed can always be used; cutting action is more efficient and there's less possibility of wrecking the cutter. There are many other CINCINNATI Dial Type advantages:

- **Power dual selection of feeds, 3/8" to 90" per min.**
- **Independent, directional controls, with name knobs**
- **Automatic backlash eliminator**
- **Dynapoise chatter-damping overarm**
- **Automatic table feed cycles available for plain and vertical machines**

Want more information? Look in Sweet's Machine Tool File for brief specifications; complete data in catalog No. M-1915.

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CINCINNATI NO. 2 UNIVERSAL DIAL TYPE MILLING MACHINE easily takes a heavy helical milling cut.

DIAL TYPE LINE		table traverse	main drive	automatic table cycles available
No. 2	Plain Universal Vertical	28"	10 hp	yes no yes
No. 3	Plain Universal Vertical	34"	15 hp	yes no yes
No. 4	Plain Universal Vertical	42"	20 hp	yes no yes

CINCINNATI

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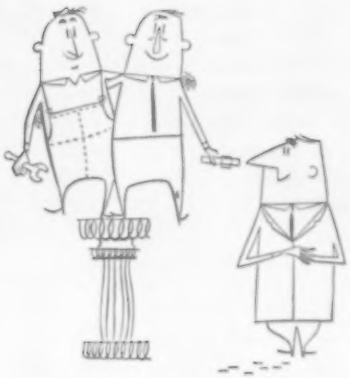
HARDENING MACHINES • OPTICAL PROJECTION PROFILE GRINDERS • CUTTING FLUID • GRINDING WHEELS



Longnecker: 'People Like Responsibility'

"PEOPLE count in industry." That's Walter L. Longnecker's expression of a keystone in his business philosophy. He's manager of operations for the Cleveland district of U.S. Steel Corp.'s American Steel & Wire Division.

He observes: "Most people have much more to offer than is apparent on the surface. They will respond admirably to greater responsibility."

Giving people responsibility is a practice the operations manager has followed throughout his career. He started with the company at Donora, Pa., as a technical apprentice in 1939. Now, at 40, he's the youngest district manager in American Steel & Wire. He explains his reason for giving people a chance to do things on their own: "I knew I wanted the opportunity for responsibility when I started, and I thought everyone else felt the same."

How It's Done—Mr. Longnecker says: "Push responsibility to the lowest level that can handle it." He gives two advantages to this procedure: "1. You get to the man who is closest to the problem you want solved. 2. Invariably, his reaction is that he is being given the privilege of helping to run the company."

Effectiveness of the principle is universal, Mr. Longnecker believes. He says: "It works with wage earners, and it works with management."

Also Needed—Along with responsibility, people need the facts. A leader, Mr. Longnecker believes, must make sure that the pipelines of communication are open. "Use all media," he encourages, "and make as many personal contacts as possible even though you know everyone can't be reached that way."

An Example—When American Steel & Wire installed its high speed rod mill in its Cuyahoga works, communication played an important part. "First," Mr. Longnecker says, "we had to determine what we wanted and what the mechanical and electrical industries could give us."

Before the old mill was replaced by the high production unit, the workers were shown how the change would affect them. Foremen were given scale models of the mill to show their men how it would operate and what their jobs would be.

The result: "Workers competed to get on the new mill although other jobs were preplanned for those who could not be transferred."

A Guide—"A leader must prove himself a contributor to the team," believes Mr. Longnecker. The first line of supervision must be able to handle the technical details. People in the higher levels of supervision, he says, need to develop a background of experience to handle the broader problems of running a business.

Business Aircraft: What They Sell for

Piper Tri-Pacer	$ 7,895
Mooney M-20	12,500
Cessna 180	14,000
Beech Bonanza	22,000
Helio Courier	25,600
Piper Apache	36,790
Riley Twin-Navion	37,500
Cessna 310	60,645
Grumman Widgeon	70,000
Beech Twin-Bonanza	78,000
Aero Commander	79,500
De Havilland Dove	108,450
Beech Super-18	125,000
Lockheed Lodestar	175,000
Douglas DC-3	240,000
Convair 340	750,000

Source: National Business Aircraft Association.

Cessna Aircraft Co.

Business Planes Fly High

Sales records were set by all manufacturers in 1956. More firms come to consider business plane use a necessity rather than a luxury limited to top executives

NO LONGER a luxurious "taxi" for top executives, the company-owned airplane is becoming a necessary sales tool. Hundreds of metalworking firms are discovering that private aircraft aren't limited to big steelmakers who use planes to ferry executives between distant plant sites.

Large corporations pioneered in use of aircraft to conserve the time of valuable management talent by flying to plant and mine locations not served by commercial aircraft. Republic Steel Corp., Cleveland, had private aircraft before World War II. Now smaller firms with single plant locations report that investment in private planes will help boost sales. Here's how:

Wider Scope — Many companies can increase sales by covering additional territories at more frequent intervals. The business airplane today operates in more than 6000 airports in the U.S. Commercial airlines serve only about 600 cities. "Customer relations are improved when key executives fly to a trouble spot and solve production or supply difficulties," says Cessna Aircraft Co., Wichita, Kans.

Koppers Co. Inc. built an ore sintering machine for Blackwell Zinc Co. Inc., Blackwell, Okla. National Steel Corp. officials wanted to see how the machine functioned, so Koppers flew them to the plant site. Pleased with what they saw, National later ordered machines for Weirton, W. Va., and Detroit plants.

Better Service — Lukens Steel Co., Coatesville, Pa., bought a twin-engine airplane from Aero Design & Engineering Co., Bethany, Okla., late in 1956. Lukens officials say the aircraft will help sales by supplying easy and convenient transportation to Coatesville for the firm's customers.

Parker White Metal Co., Erie, Pa., reports improved customer relations rank with executive time savings. In addition to flying executives and engineers to meetings with customers and potential customers, the firm's Piper craft speeds delivery of badly needed castings or emergency repair parts.

More Jobs—Another Piper user, a construction firm with projects in Colorado, Oklahoma, Georgia and Arkansas, told STEEL that owning an airplane enabled the firm to supervise more jobs more efficiently. "We're handling much more work than we could if we were earthbound," representatives declare.

Many large corporations, using aircraft at least part time to carry executives between plant locations and business centers, report that the basic reason for owning planes is to boost sales. Says Westinghouse Electric Corp., Pittsburgh: "The ultimate aim of all management effort is sales. Enlarging these efforts helps sales. It's not uncommon for a top executive to have a morning conference in Pittsburgh, a luncheon conference

in Washington and a dinner meeting in New York. We also use planes to take customers to Westinghouse plants to study installations similar to the one being negotiated."

B. A. Gustafson, vice president, Sundstrand Machine Tool Co., Rockford, Ill., says business planes give customers better service on quotations, and engineering approvals or revisions.

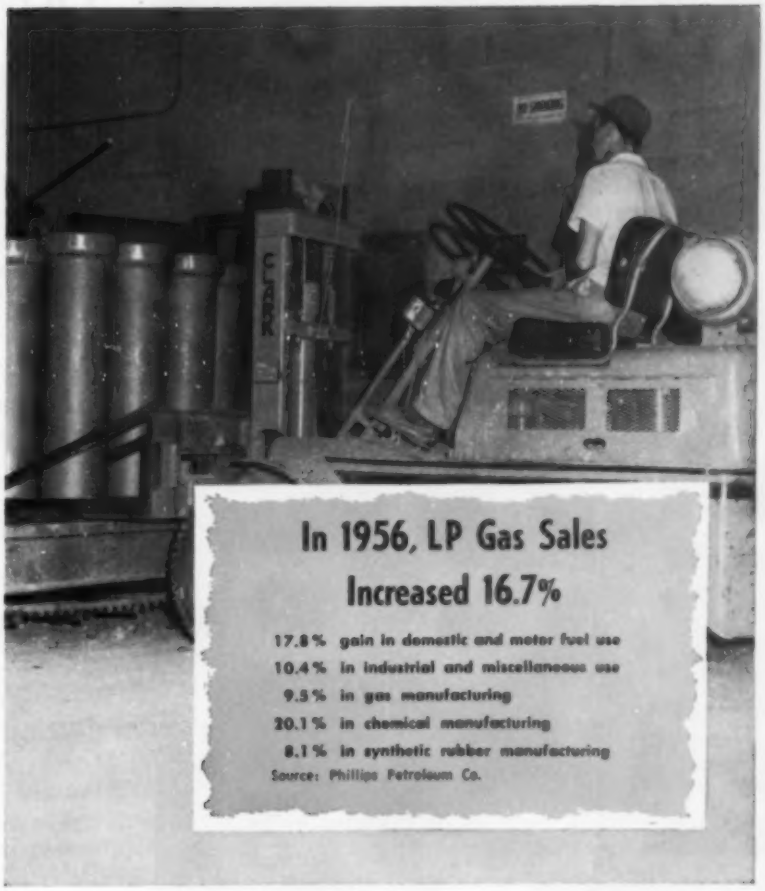
Mileage—Spurred by the desire to get best possible use from this new sales tool, aircraft owners are broadening their range. Westinghouse has tripled its annual flight mileage since 1949. M. A. Hanna Co., Cleveland, has logged 1.5 million miles in two Lockheed aircraft purchased in 1950 and 1953. Each is in the air 1000 hours per year.

The National Business Aircraft Association, Washington, reports that 6000 corporations owned 22,935 aircraft in June, 1956. Two years earlier, the figure was 18,570. The trend is to light twin-engine aircraft, NBAA adds. Corporations owned 3480 multi-engined craft in 1956, compared with an estimated 2440 in 1954.

Dollar Volume — "All business airplane manufacturers set sales records during 1955, and 1956 statistics will be even more impressive," say Cessna executives. That firm reports all manufacturers sold 3071 planes (worth $58 million) in 1954 to business users. In 1955, 4434 units valued at $91 million were sold.

With a sizable investment in aircraft, owners make maximum use of the planes. Large corporations often ask executives to decline space on commercial flights if company planes are flying to the same cities. NBAA points out that use of company planes should be scheduled far enough in advance to insure full loads.

Jet Age — Despite fast-moving developments of the last ten years, aircraft producers promise that the best is yet to come. Fairchild Engine & Airplane Corp., Hagerstown, Md., reports that Continental Can Co., New York, is the first corporation in the world to place an order for high-speed jet aircraft for use in executive transportation. Continental has ordered three four-engine jets and other corporations have ordered two.


In 1956, LP Gas Sales Increased 16.7%
17.8% gain in domestic and motor fuel use
10.4% in industrial and miscellaneous use
9.5% in gas manufacturing
20.1% in chemical manufacturing
8.1% in synthetic rubber manufacturing
Source: Phillips Petroleum Co.

Lift trucks are becoming a more important industrial market for LP gas

Trend to LP Gas Cited

LP GAS industry added over 1 billion gal to its 1955 sales total to bring sales in 1956 to almost 7 billion gal.

That record increase was headed by impressive gains in use by chemical manufacturing firms, motor fuel and house heating (see table). Another record year is seen for 1957, Phillips Petroleum Co.'s annual report on the liquefied petroleum gas industry says.

Trends—The biggest users of LP gas for motor fuel in internal combustion engines are trucks, buses, tractors, industrial trucks and irrigation and drilling engines. Buses consume 30 million gal of the fuel a year: 2000 buses were running on it at the beginning of 1956; 250 more were ordered for delivery in 1956 or early 1957.

LP gas tractors make up about 5 per cent of total tractor production. While they showed production increases last year, total tractor production fell 25 per cent.

Lift trucks and cargo refrigeration units represent the fastest growing market for LP gas in motor fuel, says Phillips. About 614 million gal of gas are consumed in industry and miscellaneous uses.

New Plants — Twenty-six new plants started producing LP gas last year to boost capacity by almost 1.2 million gal a day. Perhaps 15 new plants will be added in 1957 to produce an additional 750,000 gal a day.

How Great Lakes Steel *teems* quality

You're up on the catwalk above the pouring platform along the open-hearth pit at Great Lakes Steel. Right below, one of the giant 250-ton teeming ladles is filling another train of hot-top ingot molds.

At no step in the production of good, deep-drawing steel is control of quality more important than in the teeming operation. For defects can easily develop *unless* the entire pouring operation is done exactly right . . . the way it is at Great Lakes.

For example, these hot-top molds are designed to eliminate shrinkage cavities in the finished product. A special lining compound of graphite or tar blankets the inside of every mold to form a highly protective shield for the delicate ingot surface.

And that's only a sample of the care Great Lakes takes *every step of the way* to maintain high and uniform quality steel!

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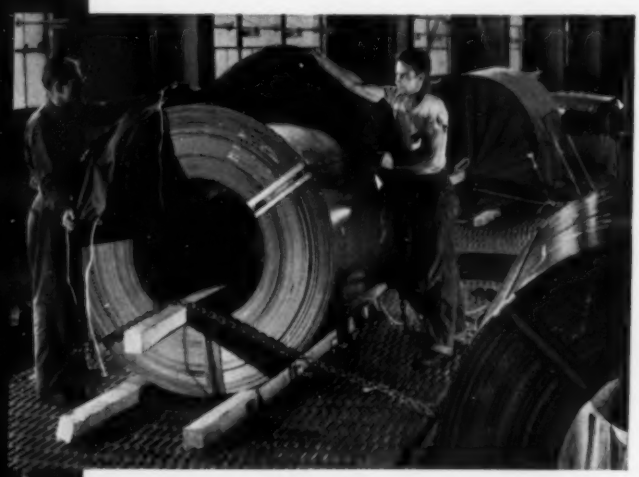

BUILT-IN QUALITY of Great Lakes steel is guarded through every step to final delivery. Here shipments of flat-rolled sheet coils are covered with tarpaulins for protection.

Eugene J. Hardig, chief engineer, Studebaker-Packard Corp., and Harold E. Churchill, president, report a supercharger will be standard equipment on the 1957 Golden Hawk

Answer to Fuel Injection

Superchargers offer easier maintenance and service requirements than fuel injection systems, report some auto engineers. Ford and Pontiac make moves

FLURRIES caused by fuel injection have brought another round of industry announcements—this time on carburetors and superchargers. Ford Motor Co. and the Pontiac Motor Division of General Motors are latest additions to the pack.

Ford division reports it will make a 300-hp supercharged V-8 engine available for all '57 models. The supercharger apparently is a stop-gap to give Ford dealers a talking point to counteract the sales campaign Chevrolet is pitching on its injector. The engine will be in short supply until May.

Specs—The supercharger will be tied into a four-barrel carburetor on Ford's 312 cu in. V-8 power plant. Compression ratio is 8.5:1. It replaces a dual four-barrel carb job rated at 285-hp, which formerly held top billing as Ford's most powerful 1957 engine.

This move on Ford's part indicates that some of the auto companies want to hold off as long as possible on fuel injection so they can make sure the injectors they bring out will work satisfactorily.

H. A. Matthias, Ford division chief engineer, reports: "We have studied several types of new fuel systems. From the standpoints of dependability and ease of maintenance, it was decided that at present the supercharger offers the best system for obtaining increased performance at minimum weight penalty."

Rundown — Superchargers have been in business even longer than fuel injectors. They've been used primarily on aircraft and on racing and sports cars until this year when Studebaker announced the Jet Stream supercharger would be standard equipment for its Golden Hawks. It's understood that Packard also will use the supercharged Hawk engine in this year's model.

A supercharged engine doesn't depend on intake manifold vacuum to draw fuel through the carburetor. The supercharger, which looks and works like a fan, blows the fuel-air mixture into the cylinders. It operates off a V-belt.

Results—Studebaker asserts its job will boost engine power 40 per cent. Ford makes no definite claims, but the performance in-

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crease should be comparable. Another asset: The supercharger automatically shifts into idling speed during normal cruising to cut down on gas consumption.

Auto company engineers feel that while a supercharger may use more gas than a fuel injection system, its simpler operation makes for easier maintenance and servicing. Costs are about the same. Ford's supercharged engine has a suggested list price of $447.40, compared with a $485 tag on Chevrolet's injector model.

Triplets — Pontiac, meanwhile, has entered a triple two-barrel carburetor in the race. Called Tri-Power, it's similar to the triple jet job offered by Oldsmobile (STEEL, Nov. 12, p. 94). The division has announced a fuel injector, too, but it will be used only on a few thousand demonstrators this year.

Tri-Power is available only with Hydra-Matic transmissions and V-8 engines. Probable list cost: $83 (which is the suggested price on Olds' unit). Horsepower is upped from 270 to 290 with the carburetor pack.

Operation—The system consists of a conventional twin barrel carb (primary) and two secondary twin carbs. Only the primary unit operates during engine warm up, idle and part throttle operation. This primary carb is hooked up to the automatic choke and throttle control.

When the engine is opened up to passing or full throttle range, all three carburetors kick in, tripling air flow through the carbs and stepping up the rate of fuel-air flow into combustion chambers. The result is more power when it's needed.

Line-Up — Superchargers and triple-twin carbs are current rebuttals to fuel injection. They offer easier maintenance, but poorer gas economy than injectors. Performance isn't quite as good; price differences are little except for the carbs.

Big advantage: Both superchargers and carburetor systems have had plenty of road testing before being made available to the public. They should be much more trouble free than the injectors now being offered.

Stubborn — Chevrolet, however, has not revised its plan to make 500 fuel injection systems a month during 1957. Some division engineers privately think that's an optimistic goal. Less than 300 of the injectors have been built since the device was announced.

Edward N. Cole, Chevrolet's general manager, reports the division will build a radically new V-8 engine for 1958. The company's Tonawanda, N. Y., plant is being modernized to handle the improved engine.

And rumor has it that two of the Chrysler divisions will announce fuel feed systems soon. Whether they will be superchargers, injectors or triple carburetors hasn't been decided.

Tool and Diemakers Busy

Detroit area tool and die shops report that Ford and GM have scrapped some 1958 dies and have released orders for new work. The reason seems to be the bigger companies feel they'll have to make more changes than had been anticipated to keep up with Chrysler's forward look.

A quick roundup of the shops hints that Buick and Oldsmobile bodies, in particular, will get more of a change than had been expected in the so-called facelift year.

It's already known that Pontiac and Chevrolet will make a major switch in '58. Pontiac is scheduled to have its own frame. Both divisions plan new bodies and greatly improved braking and suspension systems.

While toolmakers say they are not now seriously hampered by a plate shortage, most firms expect tooling plates will be in tight supply by the end of the second quarter. There's some talk that more magnesium tooling plates will be used for 1958.

As more and more car builders release tooling orders ahead of the usual dates, it looks like once more the industry hopes to avoid last minute overtime charges and be in position, if necessary, to bring out 1958 cars a few weeks earlier than the '57 models appeared.

U.S. Auto Output

Passenger Only	1956	1955
January	611,190	659,508
February	554,667	675,495
March	575,559	794,015
April	547,766	753,851
May	471,994	724,892
June	430,141	649,393
July	448,804	659,763
August	401,997	614,493
September	190,709	461,591
October	388,922	517,813
November	581,088	749,061
December	599,083†	682,257
Totals	5,799,920†	7,942,132

Week Ended	1956	1955
Dec. 8	167,576	178,409
Dec. 15	158,431	169,256
Dec. 22	154,832	150,881
Dec. 29	99,577	105,670

	1957	1956
Jan. 5	107,959†	125,245
Jan. 12	155,000*	149,995

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

Magnets Catch On

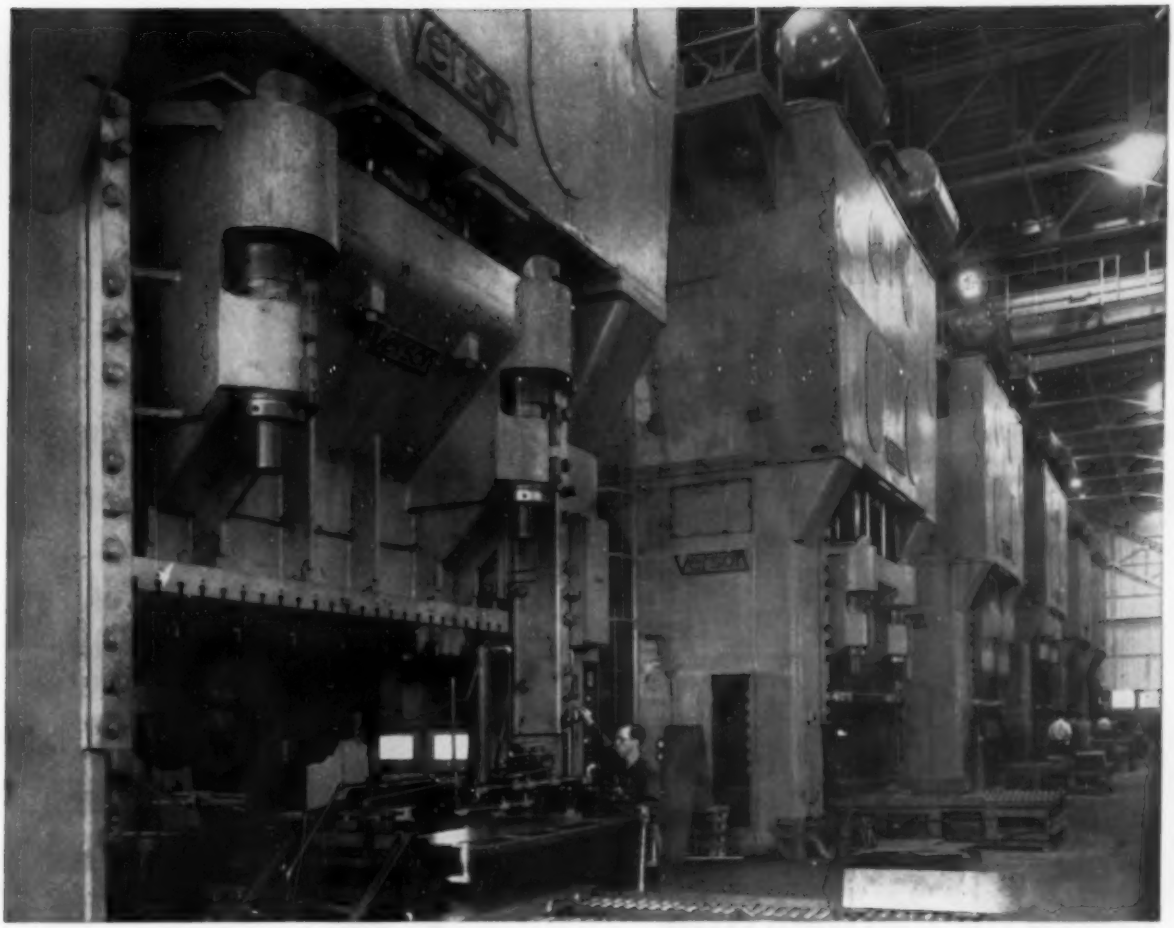
Auto plant engineers have found a replacement for Alnico magnets. These permanent attractors won't demagnetize in an electromagnetic field. They're made by Storch Products Co., Detroit.

Al Dawe, welding engineer, Chrysler's De Soto division, says: "We're using Storch magnets on gas tank welding fixtures. The upper half of the tank is held upside down in the fixture with magnets. Then we clamp the other half on top. Magnets have to do the job because there's no room for clamps on some parts of our welding line."

Another advantage is claimed by a Ford engineer: "The magnetic field is so much more concentrated we can pick up one piece at a time from a stack of work parts." He admits the concentrated lines of flux pose a small problem: The magnet must directly contact the piece to attract it.

A safety engineer in Chrysler's Highland Park, Mich., plant says he's using the magnets on safety pliers to pull flashings out of stamping presses. "We've pulled out pieces weighing up to 60 lb," he reports. This magnet is about the size of a cigarette package.

The magnetic material is bonded in an aluminum epoxy. Ed Storch, president, Storch Products, says he will double the strength of the magnets within 90 days. A similar type magnet recently has been announced by General Electric Co.



Could you compete with a press room like this?

the RISING COST of Obsolescence

Obsolescence is the creeping malignancy of manufacturing. The longer it goes unchecked, the weaker its victim becomes, the more costly the cure. Recent developments by Verson in the press forming of metals have obsoleted processes that were the most efficient available a few short years ago. Check your plant for symptoms.

Unless you're in the automotive industry you probably won't have to compete with this particular press room. But, if you make anything that is pressed out of metal you probably will have to compete with a press room equally modern and efficient.

What does this mean to you?

Competition that reaches its culmination in the market place often begins in the shop. Here is where a large measure of your competitive price position is determined. Here is where profits can be made—or lost.

What's the answer?

The answer is a *planned* program of modernization of your production processes. Sit down with your suppliers and develop a program for systematically replacing inefficient, obsolete methods. Generally, you need not replace it all at once. Very often one machine at a time can be replaced, just so it is done to a well developed plan.

In your press room, sit down with Verson. Put Verson experience in the development of production processes to work for you. Utilize the know-how that results from Verson's approach to press building—"Anyone can build a press, Verson builds production processes". Write or phone.

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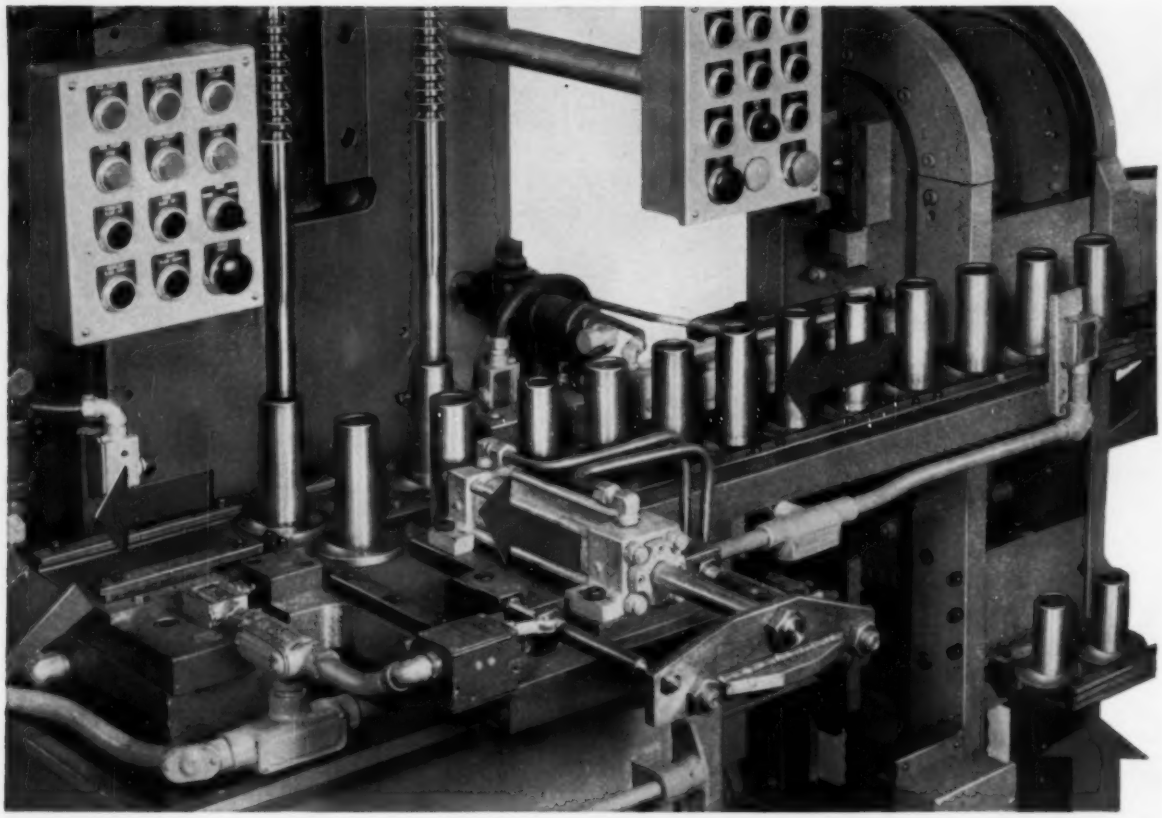


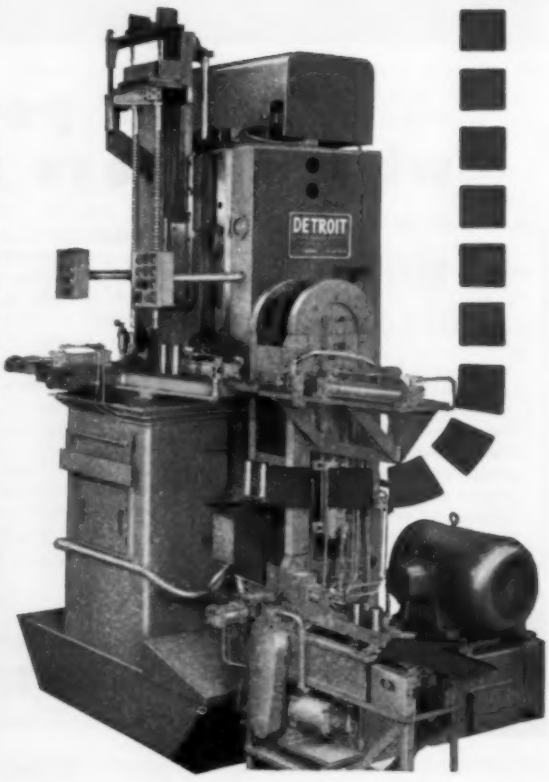
STANDARD Broaching Machine Tooled for AUTOMATION

This broaching setup on a Detroit 15-ton, 42-inch Vertical Pull Down Machine illustrates *practical* automation! It combines the economy of a standard machine, readily retooled for production changes, with a special work handling system that makes floor-to-floor operation fully automatic.

Flanged work pieces are loaded at floor level, conveyed to an elevator, raised, pushed off and shuttled into broaching position, broached and unloaded . . . all without an operator. Each broaching stroke sizes the I.D. and removes excess welding at the flange joint. Parts are handled as fast as they can be supplied by the "automatics" ahead of this operation.

The same broaching specialists who created this productive combination of "standard and special" can help solve *your* production problem. Send parts, prints or details now.

Write for bulletin describing Detroit Vertical Pull Down Machines.



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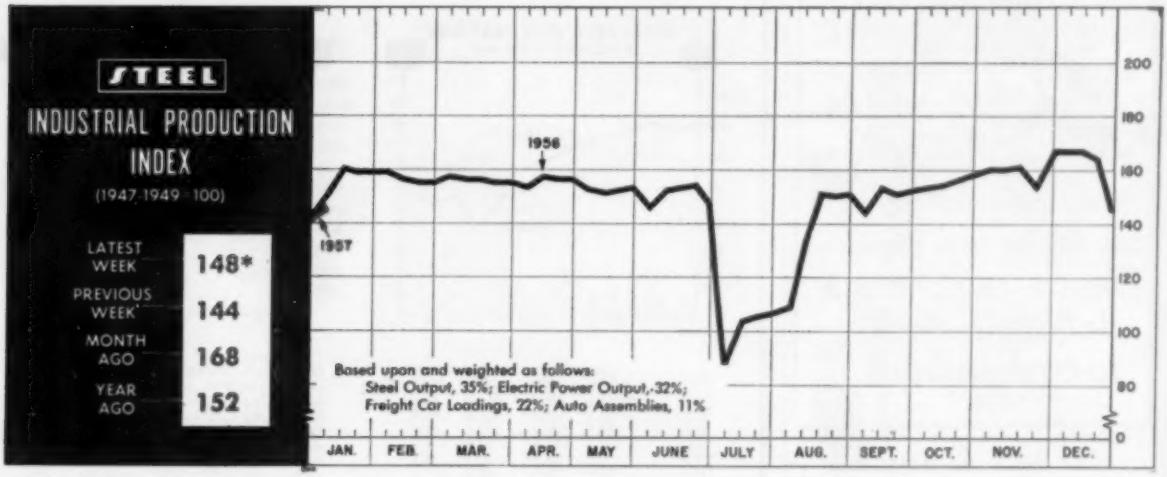

*Week ended Jan. 5.

Business To Hold Its High Levels

BUSINESS ACTIVITY in January, 1957, is rebounding from the holiday letdown. Industrial production is well on its way to attaining the heights freely predicted for it last month.

At first glance, STEEL's industrial production index (above) indicates the opposite. But on closer examination, it fortifies this contention. Jan. 1 fell on a Tuesday this year, reducing the workweek to three days in many industries. Even so, the preliminary estimate for the week ended Jan. 5 came up to 148 per cent of the 1947-1949 base period. Given a full five-day workweek, as in 1956, the first score for 1957 would have equaled or bettered the 152 posted in 1956's initial week.

Basic—Take the automotive industry. Production in the shortened week reached almost 91,000 autos. Projected to a full week, that would be about 160,000 units, equal to the best weeks of 1956. Detroit is planning output of that magnitude for the next couple of months, based on current sales and an orderly inventory buildup.

Steel mills barely paused during the holidays, maintaining near capacity production to meet the heavy demand. On the basis of new figures issued by the American Iron & Steel Institute, the industry is operating slightly below capacity for the first time in many weeks, although tonnage figures are reaching for new heights. AISI estimates production during the week ended Jan. 13 was 2,517,000 net tons for ingots and castings, just 7 tons shy of the all-time high set during the week ended Dec. 22. The industry will have to produce 2,559,490 tons a week to reach capacity.

Strong Spark—After going all out to match the needs of the Christmas season, the electric power industry is taking a short breathing spell. It will be some time before the industry sets a new weekly record, but with the heavy winter still ahead and industrial production still at a high level, output of electricity will con-

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,517[1]	2,490	2,428
Electric Power Distributed (million kw-hr)	11,200[1]	11,196	11,057
Bituminous Coal Output (1000 tons)	5,315	11,020	9,202
Petroleum Production (daily avg—1000 bbl)	7,400[1]	7,392	7,026
Construction Volume (*ENR*—millions)	$323.7	$282.3	$160.5
Auto, Truck Output, U. S., Canada (*Ward's*)	107,959[1]	119,276	149,386
TRADE			
Freight Car Loadings (1000 cars)	550[1]	488	611
Business Failures (Dun & Bradstreet)	174	214	174
Currency in Circulation (millions)[3]	$31,829	$31,992	$31,152
Dept. Store Sales (changes from year ago)[3]	+27%	+14%	+11%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$23,607	$19,043	$22,822
Federal Gross Debt (billions)	$276.6	$276.6	$280.8
Bond Volume, NYSE (millions)	$12.2	$18.9	$16.9
Stocks Sales, NYSE (thousands of shares)	10,614	7,671	9,632
Loans and Investments (billions)[4]	$87.9	$87.7	$86.7
U. S. Govt. Obligations Held (billions)[4]	$26.7	$26.6	$30.1
PRICES			
STEEL's Finished Steel Price Index[5]	225.92	225.92	208.90
STEEL's Nonferrous Metal Price Index[6]	251.0	251.5	273.2
All Commodities[7]	116.1[1]	116.1	111.8
Commodities Other Than Farm & Foods[7]	124.7[1]	124.7	119.8

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1957, 2,559,490; 1956, 2,461,893. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100

Says "Dependable Dan"—

Buy-as-you-go warehouse steel helps you change dollars-in-stock to-cash-in bank

For helpful action

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STEEL

COLD ROLLED STRIP

Coils • Cut Lengths • All Tempers

FLAT CR SPRING STEEL*

Soft Annealed

Hard Rolled Untempered

Coils • Cut Lengths

SHEETS

Cold Rolled • Hot Rolled

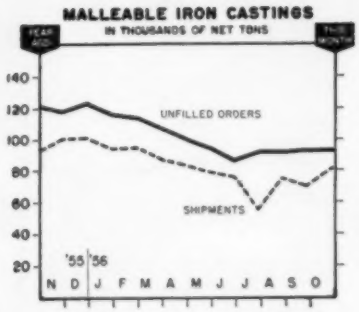
Hot Rolled Pickled

Galvanized • Long Terne

Experience-Fitted to Your Job

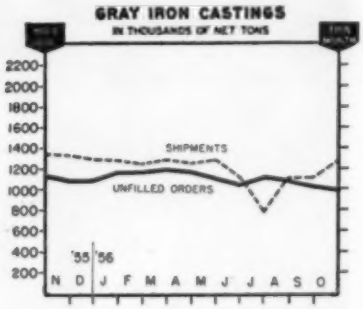
*Stocked only in Detroit

THE BUSINESS TREND



	Shipments 1956	Shipments 1955	Unfilled Orders* 1956	Unfilled Orders* 1955
Jan.	93.6	82.0	116.5	99.8
Feb.	93.5	86.0	113.6	101.8
Mar.	86.9	102.4	106.5	99.7
Apr.	83.3	101.2	99.6	104.1
May	78.8	98.4	93.7	106.4
June	75.6	99.5	86.2	107.6
July	54.3	75.6	92.1	115.4
Aug.	74.4	82.4	91.9	123.4
Sept.	69.4	87.2	92.6	116.6
Oct.	81.5	90.9	92.7	121.3
Nov.	....	99.3	....	117.0
Dec.	....	99.9	....	123.1
Total	....	1,104.8		

*For sale. U. S. Bureau of the Census
Charts copyright, 1957, STEEL.



	Shipments 1956	Shipments 1955	Unfilled Orders* 1956	Unfilled Orders* 1955
Jan.	1,250	1,092	1,158	782
Feb.	1,215	1,106	1,141	852
Mar.	1,255	1,315	1,163	842
Apr.	1,218	1,294	1,145	966
May	1,236	1,310	1,086	938
June	1,152	1,296	1,041	982
July	763	1,070	1,109	1,050
Aug.	1,103	1,226	1,074	1,160
Sept.	1,110	1,253	1,037	1,151
Oct.	1,275	1,310	996	1,113
Nov.	....	1,306	....	1,062
Dec.	....	1,260	....	1,075
Total	....	14,838		

*For sale. U.S. Bureau of the Census.

tinue to show significant gains over year-ago figures.

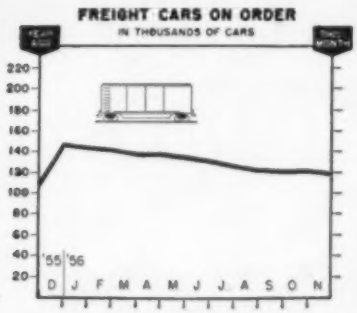
Freight car loadings during the first quarter will continue to show the improvement that marked all of 1956. The 13 regional shippers advisory boards anticipate a gain of 3.7 per cent over the first quarter of last year, says the Association of American Railroads. Among the biggest increases will be 10.3 per cent for loading of automobiles and trucks. Last year finished 0.5 per cent ahead of 1955 for all loadings, with coal providing the big punch—7.6 per cent ahead of the previous year.

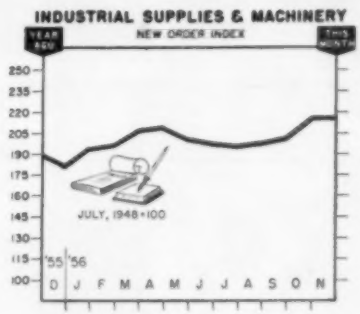
Consensus: Good Half

Now that the crystal balls have been put back on the shelf for another quarter or two, it's safe to report that the consensus is: A continuing rise in business during first half, but at a slower pace than during 1956. Many industries, like steel, are so close to their operational ceilings that marked gains are not possible. Translated into mathematical terms, this means that the trend line for the first half of 1957 will closely parallel the 1956 line (see page 55) but about 2 points above it.

Rounding Off Coming?

In the middle of all this prosperity, there are signs that we may be entering a rounding off stage of the boom. Backlogs in several important metalworking industries are beginning to shrink. With the exception of malleable castings, founders are beginning to work away unfilled orders (see charts above). Machine tool producers have reduced their estimated backlog from 7.8 months to 6.8 months in the last half year. Freight car builders are down to 119,626 undelivered cars on the books from a high of 147,320 cars a year ago. This is colored somewhat by the rush to place orders before the government clamped down on fast tax amortizations at the end of 1955. Nevertheless, current awards are not all the industry had hoped they would be (see chart, p. 57). Total unfilled orders for all durable goods industries shrank during October, the latest month for which government figures are available. While both production and new orders are at record levels—seasonally adjusted—this is an indication that production is overtaking new business. Even at that, there is enough





	Awards		Backlog (end of month)	
	1956	1955	1956	1955
Jan. ..	1,818	5,087	144,946	18,395
Feb. ..	1,675	2,690	141,437	18,633
Mar. ..	1,618	2,156	137,070	17,974
Apr. ..	6,559	2,706	137,436	17,930
May ..	2,403	3,041	133,072	16,856
June ..	2,859	13,365	129,409	27,102
July ..	2,642	18,007	126,194	42,858
Aug. ..	2,575	13,405	122,870	52,803
Sept. ..	3,949	3,228	122,421	52,913
Oct. ..	6,532	12,843	122,250	61,954
Nov. ..	4,172	51,066	119,626	109,370
Dec. ..	....	42,278	.....	147,320
Total .	....	169,872		

American Railway Car Institute.

	1956	1955	1954
Jan.	192.7	164.4	139.8
Feb.	195.9	175.1	140.5
Mar.	206.7	186.9	141.5
Apr.	208.6	173.7	131.9
May	200.6	191.6	129.4
June	197.8	189.1	136.4
July	195.6	163.7	119.4
Aug.	196.8	181.2	132.5
Sept.	200.7	203.2	148.1
Oct.	215.6	190.0	136.3
Nov.	215.9	189.7	146.2
Dec.	....	180.0	148.8

Amer. Supply & Machinery Mfrs.' Assn.

business on the books to keep industry operating at peak levels.

Consumer Holds Key

The consumer is on the spot for 1957. He's in a better position than ever before to make it a good year or just run-of-the-mill. During November, personal income advanced to an annual rate of $333.6 billion, up $1.1 billion from the October rate and $19.9 billion above the November, 1955, rate. That means more money to spend or to pay off debts. And he's getting deeper in debt, although at a reduced rate compared with 1955. Consumer credit rose to $31 billion in November, a gain of $213 million over October despite a reduction in auto paper outstanding. That the consumer is still in a spending mood was borne out during the Christmas season. During the four weeks ended Dec. 29, department store sales topped the 1955 period by 7 per cent, despite the fact the Christmas sales a year ago were at record levels.

Appliances in Sales Slump

A sales slump, part of which is seasonal, is plaguing appliance makers. One of the longest strings of record breaking months in the industry's history was broken in November when factory sales of standard-size vacuum cleaners slipped to 300,381 units, down 19 per cent from the preceding month. Not since August, 1954, has the industry failed to establish a monthly sales record of some kind.

In the home laundry field—perhaps the best appliance line all last year—General Electric Co. will begin a production cutback of clothes dryers and combination washer-dryers today (Jan. 14). A disappointing November and December caused GE to cut back on television set output. Westinghouse Electric Corp. has also laid off workers in its Metuchen, N. J., receiver plant.

Equipment Orders Hold Up

The demand for production tools, supplies and equipment continues to push the new order index of the American Supply and Machinery Manufacturers' Association to record levels. In November, the figure was 215.9 (July, 1948 = 100), a fractional increase over the 215.6 level established in October (see chart above).

SELF TAPPING SELF LOCKING

PHEOLL

SCHWEPPE STUDS

Patents Pending

CUT COSTS

1 ELIMINATE TAPPING
2 HOLD TIGHTER
3 CAN BE 'AUTOMATED'

WHEREVER a stud is specified, you can profitably cut production time and cost with self-tapping, self-locking Schweppe Studs. They also can replace bolts to advantage on many applications.

WHAT ARE SCHWEPPE STUDS?

They are double-ended studs made with dual thread-cutting slots at the lower end. Final threads on this end develop a positive frictional interference locking action on entering the hole.

HOW ARE THEY DRIVEN?

Schweppe Studs can be driven in an inexpensive *drilled* hole with any power stud driver. In one simple, continuous operation, they cut their own thread, drive, lock and seal.

WHAT ARE THEIR ADVANTAGES?

The *self-tapping* feature eliminates tapping time and thread inspection, tap wear and replacement, tap breakage and salvage time. The *self-locking* action of Schweppe Studs prevents loosening or backing out, even under extreme conditions.

WHAT ABOUT AUTOMATION?

Since Schweppe Studs may be located accurately from the slotted end, they can be "hopperized" for automatic feeding and driving.

• To fit many applications, Pheoll Schweppe Studs can be furnished in a broad range of metals, finishes, sizes and thread styles. Learn how you can profit... find out about the many advantages...

Write for free Bulletin 1056

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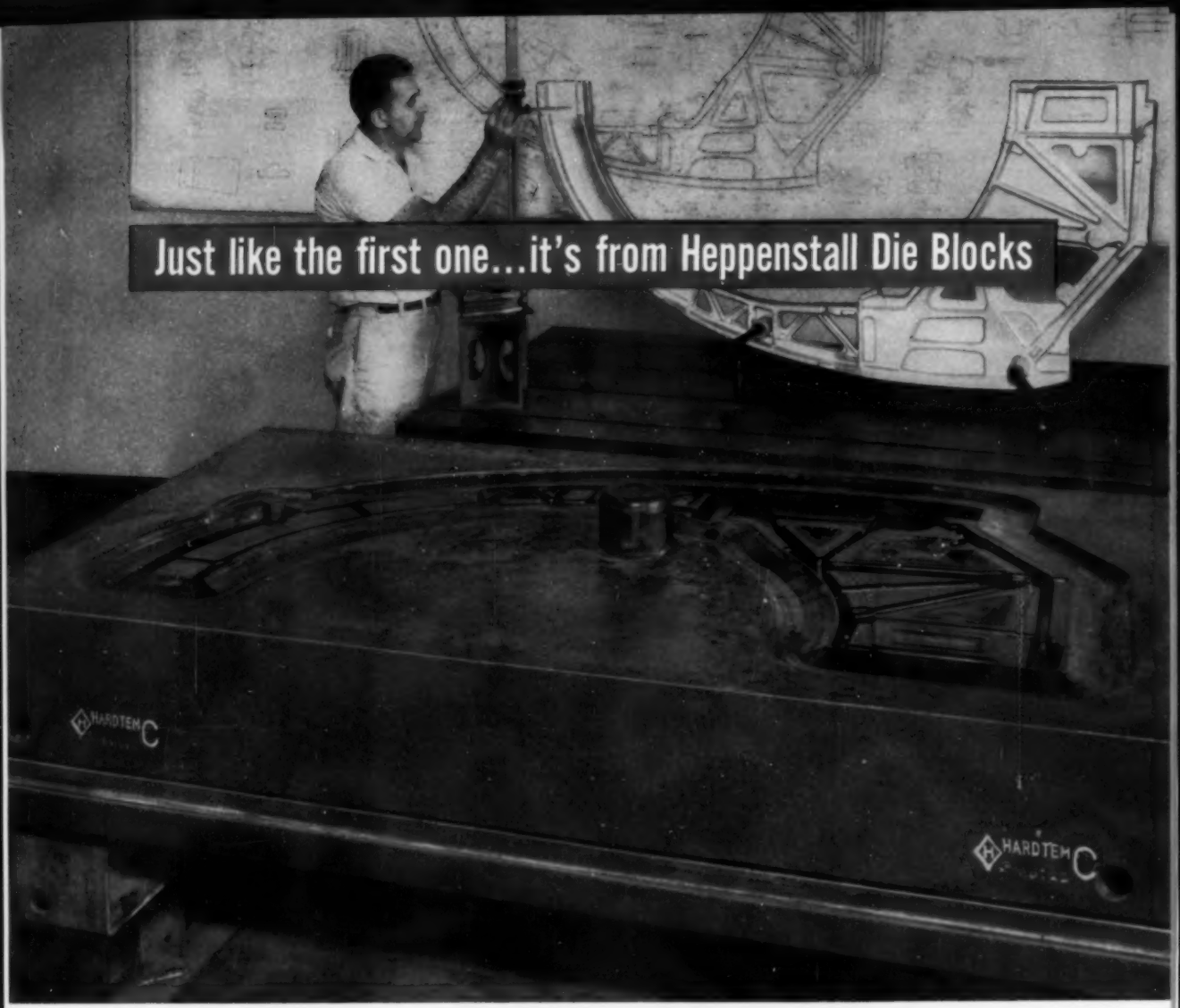

You get precision forgings... economical sinking with Heppenstall

Holding dimensions is one of the big plusses you get with Heppenstall Hardtem Die Blocks. A case in point is the production of these half-bulkheads for jet fighters at the Air Force Heavy Press Plant, Cleveland, Ohio, operated by Aluminum Company of America. Hardtem "C" Blocks are turning out these high strength aluminum alloy forgings to close tolerance specifications . . . and holding dimensions in forging after forging.

Machinability of Heppenstall Hardtem rates high, too. That's why so many tough designs are laid out on Hardtem Blocks. Veteran Die Sinkers know they can expect savings in cutting time, longer tool life, and more accurate sinkings from Heppenstall Die Blocks.

Forged on all six faces from special Heppenstall Steel, Hardtem and other Heppenstall Die Steels are manufactured in a wide range of hardnesses to match varying customer requirements of application and machinability. If you're looking for better die block machinability and service life, contact your Heppenstall Representative. He can quickly get the one best answer for you.

These five Heppenstall Warehouses carry stocks of the most popular size die blocks:

Bridgeport 5, Conn. • Detroit 32, Mich. • Indianapolis 27, Ind. • Los Angeles 22, Calif. • Pittsburgh 1, Pa.

HEPPENSTALL

... the most dependable name in die blocks

PITTSBURGH 1, PENNSYLVANIA

A. D. MONCRIEFF
. . . vice president of Michigan Tool

A. D. Moncrieff was elected a vice president of **Michigan Tool Co.**, Detroit. He will act as manager of the machine and tool division. He was manufacturing manager of the machine tool and cutting tool division.

Cornwell Quality Tools Co., Mogadore, O., elected **Charles M. Zust** president and general manager; **Kenneth H. Hulbert**, vice president-sales; **E. Arthur Kemmerline**, treasurer; **Clifford E. Rickel**, controller and assistant treasurer; **Robert C. Brouse**, secretary. **C. B. Ingersoll**, president, and **J. F. Kemmerline**, treasurer - general manager, have retired.

A. I. Nussbaum, former sales manager, Stanat Mfg. Co. Inc., joined **Loma Machine Mfg. Co. Inc.**, New York, in charge of the rolling mill division.

John H. Plischke was made director of manufacturing, **Interstate Drop Forge Co.**, Milwaukee. He was assistant superintendent.

Nelson L. Llewellyn was made division industrial engineer, **Ideal Foundry Division**, Republic Steel Corp., Newton Falls, O.

Samuel D. Kapelsohn was named vice president in charge of sales and engineering of **Grand Iron Works Inc.**, New York. He was manager of sales and engineering.

E. B. THOMPSON
. . . Parker Rust Proof gen. sales mgr.

E. B. Thompson was made general sales manager, **Parker Rust Proof Co.**, Detroit. He was assistant sales manager.

P. C. Fourney was made manager of the Alloy, W. Va., Works of **Electro Metallurgical Co.**, division of Union Carbide & Carbon Corp. He is replaced as assistant manager by **L. R. O'Brien**. Mr. Fourney succeeds the late **R. J. Price**.

H. B. Montrose Jr. was promoted to manager-heavy products sales for **Columbia-Geneva Steel Division**, U.S. Steel Corp., San Francisco.

John P. Poth joined **Bullard Co.**, Bridgeport, Conn., to fill the new post of director of engineering. He was vice president-engineering at Engineering & Research Corp.

Myrle Baker was made director of special projects, **Union Tool Corp.**, Warsaw, Ind. He served in an engineering and advisory capacity at the Detroit Tank Arsenal and before that was general manager of Spurgeon Co.

L. C. Daniels was appointed general manager, **Buda Division**, Allis-Chalmers Mfg. Co., Harvey, Ill. He succeeds **Ralph K. Mangan** who retires as president and general manager of the division. **Owen J. Higgins** was named general manager of the Harvey works.

EDWARD R. RANDALL
. . . Walter Kidde director-purchases

Edward R. Randall was made director of purchases for **Walter Kidde & Co. Inc.**, Belleville, N. J. New purchasing agents are: **Leo C. Reddan** for the industrial and marine division; **George W. Lukacs**, engineering and research division; **John P. Blake**, aviation division.

Air Products Inc., Allentown, Pa., elected **Clarence J. Schilling** vice president and chief engineer; **Edward Donley**, vice president and general manager.

Edward E. Schwegler was elected a vice president of **New Jersey Zinc Co.**, New York.

Air Reduction Sales Co., division of Air Reduction Co. Inc., appointed three regional vice presidents: **A. C. Brown Jr.**, general sales manager, was named vice president-eastern region with offices in New York; **D. D. Spoor**, equipment sales manager at New York, was made vice president-midwestern region, Chicago; **J. J. Lincoln Jr.**, vice president, New York, becomes vice president-southern region, Houston.

Carborundum Co., Niagara Falls, N. Y., elected these vice presidents: **Niles C. Bartholomew, Gene DeMambro, I. Wendell Hamm, Joseph S. Imirie** and **Leslie E. Simon.**

Scovill Mfg. Co., Waterbury, Conn.,

appointed **Ernest B. Lawton** sales promotion manager for its general manufacturing division and its forging and screw machine division. He was sales manager, screw machine products, and is succeeded by **Joseph S. Stevens.**

George C. Stineback was made director of sales of the Chicago division of **Kendall Co.** He is succeeded as general sales manager of Polyken Industrial Tapes Division by **Jay Hodges.**

Simon J. Morana was made director of research for **Beryllium Corp.**, Reading, Pa.

William C. Steinhorst was elected president and general manager, **Emil Steinhorst & Sons Inc.**, Utica, N. Y. He succeeds the late **Henry Steinhorst.**

Youngstown Sheet & Tube Co., Youngstown, promoted **Byron Hughey** from assistant to vice president to assistant general manager of sales. **Clarence E. Short** transfers from the Detroit district sales office to Youngstown as assistant manager of flat rolled sales. **Donald C. Umbel,** manager of export sales in New York, transfers to Chicago as assistant manager of western sheet sales. **Thomas J. Connolly** succeeds Mr. Umbel in New York. **Myron L. Thomas** was made assistant district sales manager, Chicago; **Robert W. Walling,** assistant manager, high strength steel sales at Youngstown.

H. ARTHUR ZIMMERMAN

GEORGE D. GOTSCHALL

. . . Steel Improvement & Forge vice presidents

Steel Improvement & Forge Co., Cleveland, promoted **H. Arthur Zimmerman** from general sales manager to vice president-sales; **George D. Gotschall** from director of manufacturing to vice president-manufacturing; **Albert W. Smith Jr.** from director of finance to vice president and director of finance.

National Tube Division, U.S. Steel Corp., appointed **Louis F. Sattele** general superintendent of its National Works at McKeesport, Pa. He succeeds **Truman H. Kennedy,** who was made general superintendent of the Lorain, O., Works. Mr. Kennedy succeeds **Robert Urquhart,** transferred to division headquarters in Pittsburgh as executive assistant to the vice president-operations.

Duke A. Garrison and **Frederick E. Graves** were made assistants to the vice president-engineering and research at **Russell, Burdsall & Ward Bolt & Nut Co.** Mr. Garrison is at the Chicago office, Mr. Graves at Port Chester, N. Y.

W. W. Deal was made assistant to the manager of sales-western area, **American Steel & Wire Division,** U.S. Steel Corp. He is succeeded as Chicago district sales manager by **E. A. Murray. Charles P.**

LOUIS F. SATTELE

TRUMAN H. KENNEDY

ROBERT URQUHART

. . . National Tube Division operating appointments

J. WILLIAM BRYANT
. . . Reserve Mining vice president

ROBERT E. WARD
. . . New York Air Brake mfg.-director

ROBERT W. GALVIN
. . . president of Motorola

Greenlee replaces Mr. Murray as Detroit district sales manager.

J. William Bryant, treasurer and controller of **Reserve Mining Co.,** Duluth, was also elected vice president to succeed **C. L. Kingsbury,** who continues in a consulting capacity to Armco Steel Corp. Mr. Bryant moves in the near future from Cleveland to Silver Bay, Minn.

William H. Van Horn was made sales manager, Speedline Stainless Steel Fittings Division, **Horace T. Potts Co.,** Philadelphia. He was district sales manager.

Vernon A. Albaugh, former supervisor of production control at **Chrysler Corp.'s** Mound Road engine plant, was promoted to manager of production control for the engine division, Detroit.

Robert E. Ward was appointed director of manufacturing at **New York Air Brake Co.,** New York. He served for many years with Bendix Aviation Corp.

Melvin A. Young was made administrative assistant at **Laclede-Christy Co.** Division, H. K. Porter Company Inc., St. Louis. He will work on problems in production and engineering.

Alvey Conveyor Mfg. Co., St. Louis, appointed **Peter Horn** vice president-engineering; **John M. Alvey Jr.,** assistant to the president; **Walter G. Brand,** chief engineer; **Ernest E. Roth,** head of research and development.

Tom W. Smith was made general field sales manager of **Champion Screw Co.,** Chicago.

Robert W. Galvin, executive vice president, was elected president, **Motorola Inc.,** Chicago, to succeed **Paul V. Galvin,** now chairman. **Daniel E. Noble** was elected executive vice president in charge of the redesignated communications and industrial electronics division, the semiconductor products division and the military electronics division. **Arthur L. Reese** was made vice president and general manager, communications and industrial electronics division.

A. B. Williamson, plant manager of **McGill Mfg. Co.'s** bearing division, Valparaiso, Ind., was elected a vice president.

R. F. Rush joined **Ferro Corp.,** Cleveland, as sales manager, engineering division. He was assistant sales manager of W. W. Sly Co.

OBITUARIES . . .

Henry V. Erben, 58, who resigned in November as executive vice president of **General Electric Co.,** Schenectady, N. Y., died Dec. 26.

Glenn P. Miller, 51, manager of roll sales, **McKay Machine Co.,** Youngstown, died Dec. 21.

Charles E. Stone, 70, president, **Interstate Drop Forge Co.,** Milwaukee, died Dec. 20.

Robert O. Knudson, 65, assistant sales manager, special machine tool department, **Greenlee Bros. & Co.,** Rockford, Ill., died Dec. 19.

Charles W. Maledon, 58, manager of **General Electric Co.'s** construction materials-southwestern district, Houston, died Dec. 20.

J. Heber Parker, 75, chairman, **Carpenter Steel Co.,** Reading, Pa., died Dec. 28.

B. M. Sharp, St. Louis district sales manager, **Wheeling Steel Corp.,** died Dec. 23.

James J. Callahan, 61, senior metallurgical engineer, thermal products division, **Alco Products Inc.,** Dunkirk, N. Y., died Dec. 26.

Clyde A. Heisler, president, **A. C. Williams Co.,** Ravenna, O., died Dec. 20.

Fred K. Myers, assistant general manager of sales, **Superior Steel Corp.,** Carnegie, Pa., died Dec. 20.

Francis P. Leahey, 58, executive vice president, **Nichols Wire & Aluminum Co.,** Davenport, Iowa, died Dec. 27.

NOW for longer, faster action in heavy-duty grinding . . .

SIMONDS

New IL BOND

IL Bond gives a distinctly different grinding action—cutting rate is increased *without* affecting wheel life. If your present *cutting rate* is satisfactory IL Bond in harder grade will give longer life. If your present *wheel life* is satisfactory IL Bond in same grade will increase cutting action. Write for descriptive bulletin.

What goes in here .

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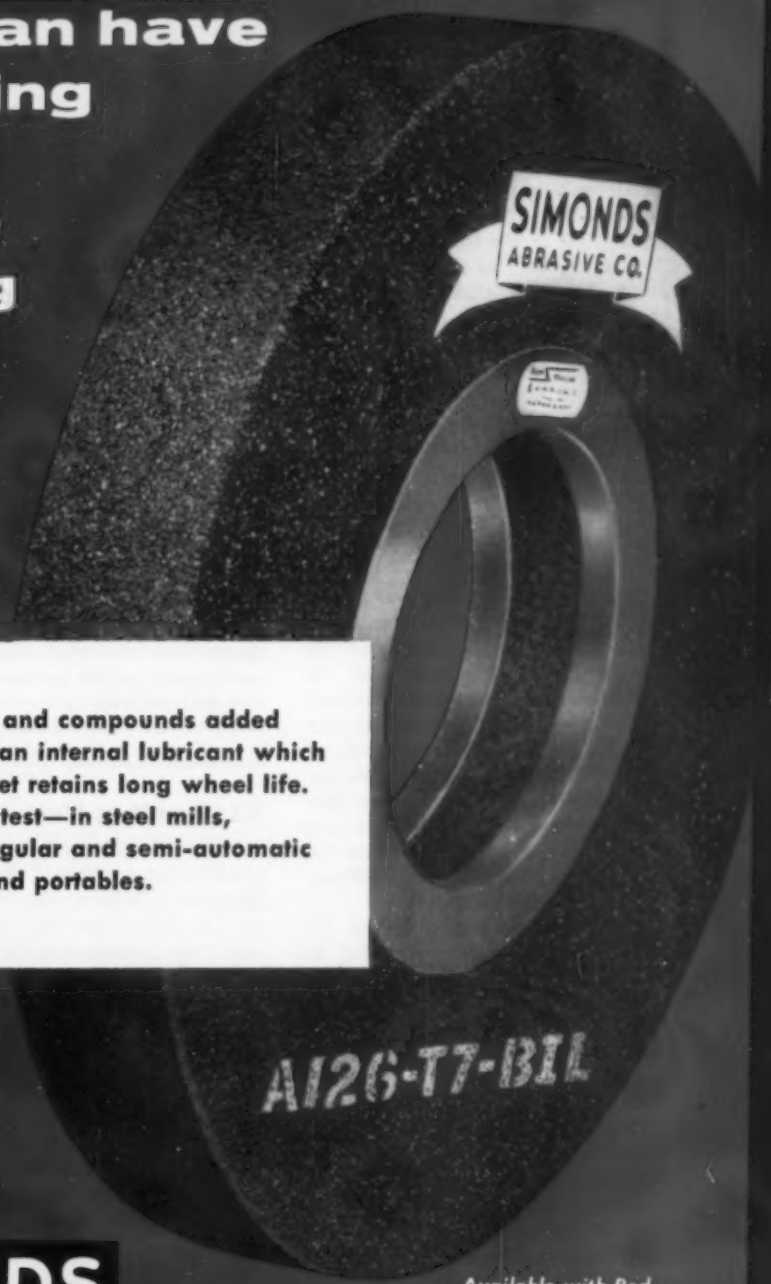
SIMONDS ABRASIVE COMPANY

Tacony & Fraley Sts., Philadelphia 37, Pa.

DIVISION OF SIMONDS SAW AND STEEL CO.

BRANCH WAREHOUSES: BOSTON, DETROIT, CHICAGO, LOS ANGELES, SAN FRANCISCO, PORTLAND

NOW you can have the fast cutting action of a softer grade with the long life of a hard wheel



It's in the wheel mix! Special chemicals and compounds added to conventional resinoid bonds provide an internal lubricant which increases the abrasive cutting action—yet retains long wheel life. Demonstrated and proved—in test after test—in steel mills, foundries and industry generally—on regular and semi-automatic swing frame grinders, on floor stands and portables.

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ABRASIVE CO.

Available with Red Streak Flanges — for metal to metal fit on mounting equipment — another Simonds Abrasive exclusive.

SNAGGING WHEELS with *New* IL BOND

Foundry Expands

National Roll & Foundry is installing grinding machine and making other improvements

DELIVERY of a quarter-million dollar roll grinding machine to General Steel Castings Corp.'s National Roll & Foundry Division at Avonmore, Pa., in early 1957 will mark the completion of the first phase of a major plant rehabilitation and capital improvement program at that plant.

National Roll became an operating division of General Steel on Jan. 1. General Steel has its general offices in Granite City, Ill., and plants in that city and Eddystone, Pa. It designs and produces large steel castings for railroads and heavy industry.

Size Range—The new roll grinder was manufactured by Mesta Machine Co., Pittsburgh. It is of the traveling table type and is equipped with automatic controls and safety devices. It will accommodate rolls up to 60 in. in diameter and 24 ft in length. The machine is well suited to the machining of rolls for the iron and steel industry and will enable the division to concentrate its roll production in this field.

Other plant improvements involved an expenditure of about $1 million. These included installation of a new lathe, overhauling other machinery in the roll shop and moving a double-unit tandem post mill from General Steel's Granite City plant to Avonmore.

Foundry Improvements—In the iron foundry, a new sand loader has been installed; the two 30-ton overhead cranes have been overhauled and modernized; new floors and walkways were built; and a new pouring pit was installed.

In the steel foundry, the old open-hearth furnace has been removed and a second electric furnace has been installed. New transformer and substation equipment has been installed to modernize the electrical facilities. The stationary sand-slinger has been converted to a motive machine, and the molding area has been relocated. New shakeout equipment and an hydraulic press have been installed.

Federated Metals Enlarges Zinc Anode Department

A foundryman is pouring molten zinc into a line of 24-lb anode molds at the Newark, N. J., plant of American Smelting & Refining Co.'s Federated Metals Division. The zinc anode department has been enlarged to provide bigger quarters for the production of anodes and storage of zinc ingots. Expansion was necessitated by increased demand for high-purity cathodic protection anodes in the marine industry. The Newark plant also makes magnesium anodes

U.S. Steel Buys Plant

United States Steel Corp.'s Supply Division purchased the Chicago Hegewisch Ordnance Division plant of U.S. Industries Inc. The plant has been processing tanks and armored vehicles.

Plan Addition at Chain Belt

Chain Belt Co., Milwaukee, will construct a 23,000-sq-ft addition to its West Milwaukee plant. The additional space will be used for the assembly and welding of building mixer drums, Railporter components, water tanks and other products.

To Build Regional Sales Office

Reynolds Metals Co., Louisville, purchased property in St. Louis for the construction of a regional sales office building. The regional sales manager is F. L. Sargeant.

Changes Name, Plans Expansion

Kelsey-Hayes Wheel Co., Detroit, changed its name to Kelsey-Hayes Co. It will build an 80,000 sq-ft plant in the Mad River Industrial Development, northwest of Springfield, O., to manufacture aircraft parts. It will be operated by its Speco Aviation Division.

Enters Pressure Gage Field

Rochester Mfg. Co., Rochester, N. Y., established a subsidiary in Pasadena, Calif. The subsidiary to be called Rochester Mfg. Co. of California, will produce high pressure gages for west coast aircraft and guided missile firms.

Edgewater Opens New Office

Edgewater Steel Co., Pittsburgh, opened a St. Louis district office and appointed P. H. Yorke as district manager.

NRC Gets ODM Aid on Plant

NRC Metals Corp., Cambridge, Mass., has been granted a certificate of necessity by the Office of Defense Mobilization for its zirconium production plant now under construction in Milton, Fla. The certificate grants a five-year depreciation period on 75 per cent of the $7,230,000 (estimated) plant and facilities. NRC has made its

equipment division an independent subsidiary under the new name of NRC Equipment Corp.

Carborundum Co. Builds

As part of a $30-million expansion program, the Carborundum Co., Niagara Falls, N. Y., will build a multimillion dollar plant in Van Wert, O., to manufacture abrasive wheels. It is scheduled for full operation by the end of 1958.

Norden-Ketay Expands Division

Norden-Ketay Corp., Stamford, Conn., will lease a 31,000-sq-ft plant to be built as an extension to the Commack, Long Island, plant of the Precision Components Division. It will produce automatic control device components for aircraft, missiles and automation.

Pump Firm Opens Branch Shop

Warren Steam Pump Co., Warren, Mass., will open a branch in the Peace Dale mill, South Kingston, R. I. The shop will do subcontract work for the main plant.

Warehouse Cornerstone Laid

The cornerstone has been laid for a 35,000-sq-ft office and warehouse for Whitehead Metal Products Co. Inc. in Windsor, Conn. The company distributes aluminum, copper alloys, nickel alloys, stainless steel and plastics.

Owosso Shifts Operations

Midland Steel Products Co.'s Owosso Division, transferred its power brake and power control manufacturing operations to a new plant at Owosso, Mich.

Will Use New Plating Process

Industria Metalurgica Tergal S. A., Sao Paulo, Brazil, electroplating firm, expects to double its production next year with a changeover to a plating process which uses periodic reverse current. The firm has obtained a license to use the process from Westinghouse Electric International Co. to meet increased demands from three European automobile firms which make cars in Brazil.

NEW ADDRESSES

Chase Brass & Copper Co. Inc., Waterbury, Conn., moved its New York metropolitan warehouse to 55-60 58th St., Maspeth, Long Island, N. Y.

The Detroit engineering offices of **Harvey Aluminum**, Torrance, Calif., have been moved to 16244 James Couzens Highway, Detroit 21, Mich. Don McLeod is district sales manager.

Acme Steel Co. moved its general offices to 135th & Perry Ave., Chicago 27, Ill. This move completes the consolidation of administrative, manufacturing, sales, service and office facilities in Riverdale, Ill.

Manufacturing and sales activities of **Grand Rapids Store Equipment Co.** have been transferred to 3800 S.E. 22nd Ave., Portland 2, Oreg. The firm is retooling and re-equipping the entire factory for the production of a new line of store fixtures.

Micro Products Engineering Co. moved to 230 Ridgewood Ave., Newark 8, N. J.

Misco Fabricators Inc. relocated in the former Dow Magnesium Co. building in Marysville, Mich. Misco is a division of Michigan Industries Co., Detroit, which in turn is a subsidiary of Consolidated Foundries & Mfg. Corp., Chicago. Misco designs, builds and fabricates heat resisting alloy and stainless steel equipment.

CONSOLIDATIONS

Union Carbide & Carbon Corp., New York, purchased the **Visking Corp.**, Chicago, maker of food casings, polyethylene film and tubing for the packaging industry. The property will be operated as the Visking Co., a Union Carbide division.

Sightmaster Corp. acquired **Mutual Electronic Industries Corp.**, a producer of cable and panel equipment and triaxial connectors. Both companies have manufacturing facilities at New Rochelle, N. Y. Sightmaster will operate Mutual as a subsidiary. Robert McKirdy will head the elasticable and fuse development engineering division and government contracts. John W. Schmidt will be plant and personnel manager.

Robertshaw-Fulton Controls Co., Greensburg, Pa., acquired **Acro Mfg. Co.**, Columbus, O., maker of electric switches and house heating controls. Operations will continue under present management.

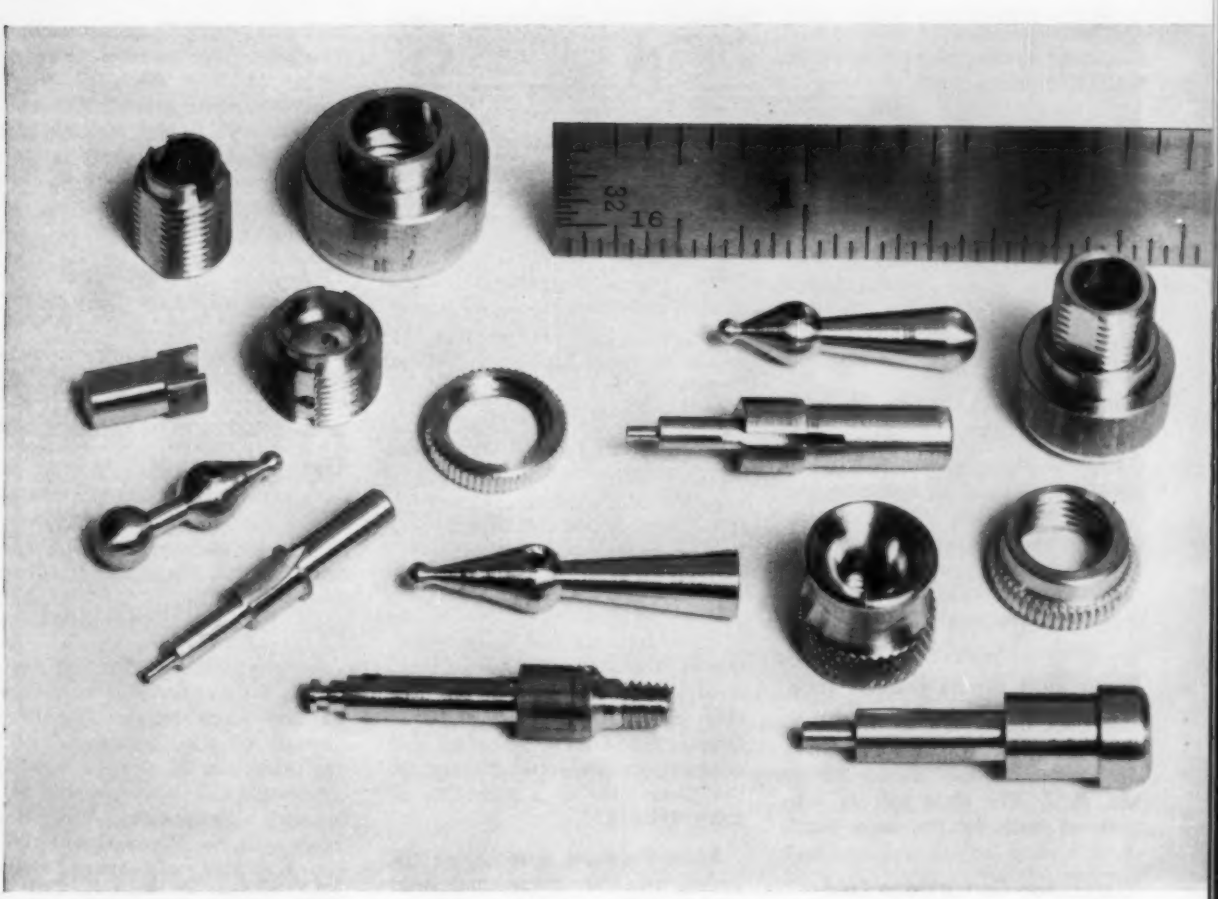
Toledo Scale Co., Toledo, O., acquired two firms: **Scientific Concrete Service Corp.**, Elizabeth, N. J., and **Metrogram Corp.**, Burlington, Vt. Both firms will be moved to Toledo Scale's main plant.

Merger of **Miehle Printing Press & Mfg. Co.** and **Goss Printing Press Co.** has been approved by directors of both corporations. Both are producers of presses, binding equipment and other graphic arts industry equipment. The new name will be Miehle-Goss-Dexter Inc. J. E. Eddy will serve as chairman. Robert C. Corlett will be president.

ASSOCIATIONS

Ervin F. Borisch, executive vice president, Milwaukee Gear Co., Milwaukee, has been appointed treasurer of **American Gear Manufacturers Association**, Washington. He succeeds T. A. Jones who has resigned as general manager of Jones Machinery Division, Hewitt Robins Inc., Stamford, Conn. The appointment was made by Gunnar E. Gunderson, president of the association.

C. S. Craigmile, Belden Mfg. Co., Chicago, was elected president of the **Illinois Manufacturers' Association**, that city. Other officers include: W. S. North, Union Special Machine Co., Chicago, first vice president; M. R. Yontz, Le Tourneau - Westinghouse Co., Peoria, Ill., second vice president; L. C. Ferguson, Western Newell Mfg. Co., Freeport, Ill., treasurer.



Typical parts machined by Leviton Manufacturing Company from Alcoa Aluminum Screw Machine Stock

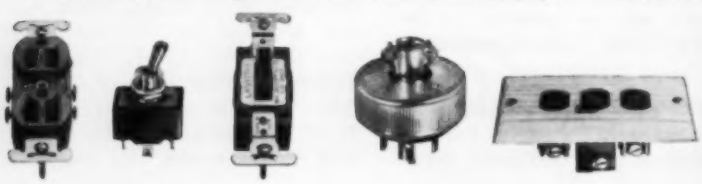
WHEN LEVITON MAKES A SWITCH, THEY USE ALCOA ALUMINUM SCREW MACHINE STOCK

Leviton Manufacturing Company first substituted aluminum for scarcer materials. Today, new parts are designed first for aluminum, and the other materials are viewed as substitutes.

For over thirty years, Leviton has specialized in the manufacture of fine electrical wiring devices for residential, commercial and industrial use. Today the company is the largest in its field and operates a huge main plant in Brooklyn, New York. Other plants are at Hillsgrove, Rhode Island; Montreal, Canada; Chicago and Los Angeles, with sales offices in all major cities of the United States and Canada.

Whether you make parts for the electrical industry, like Leviton, or market your products elsewhere, you'll find you can't beat Alcoa® Aluminum Screw Machine Stock for quality and economy. Cutting speeds as high as 1,000 feet per minute are not uncommon. Aluminum resists corrosion, offers excellent heat and electrical conductivity. Its light weight gives you up to three times as many parts per pound.

Alcoa wants to help you profit from aluminum screw machine stock's many advantages. Just call your nearby Alcoa sales office, listed under "Aluminum" in your phone book. Aluminum Company of America, 874-A Alcoa Building, Pittsburgh 19, Pennsylvania.



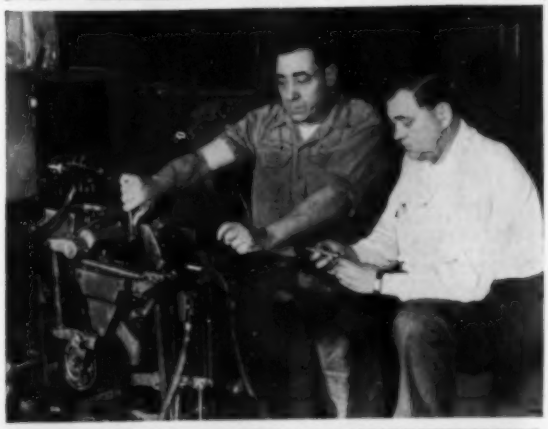
LEVITON

IN MANAGEMENT

Bernard Leviton, Executive Vice President and spokesman for the Standards Committee says, "Alcoa has been one of our suppliers since 1941. Since then, we have had a steady progression of changes to aluminum. Ours is a high-volume, high-production business. In any case where we've had a problem—whether materials, packaging or machining—Alcoa has the right man on the spot in 24 hours. And that man has the right answers. Alcoa's technical services are, in effect, an actual part of our developmental facilities. The jobs we've worked out together meet the high standards of Underwriters' Laboratories and Canadian Standards Association. At every level, Alcoa has made sure we are satisfactorily served."

IN ENGINEERING

George Smith, Chief Engineer, says, "We think Alcoa's engineering data and technical assistance set the standard and give us firm foundations of fact on which we can make decisions. I recall one specific case of many . . . Alcoa lubrication engineers gave us information that enabled us to increase tool life dramatically. Typical of the aluminum screw machine parts we make are components for toggle switches, including bat handles, bushings and mounting nuts. Close tolerances are a must. A variation of as little as .001 inch in some switch parts means the device just won't work. Yet, with aluminum, the parts fit together nicely, work smoothly."



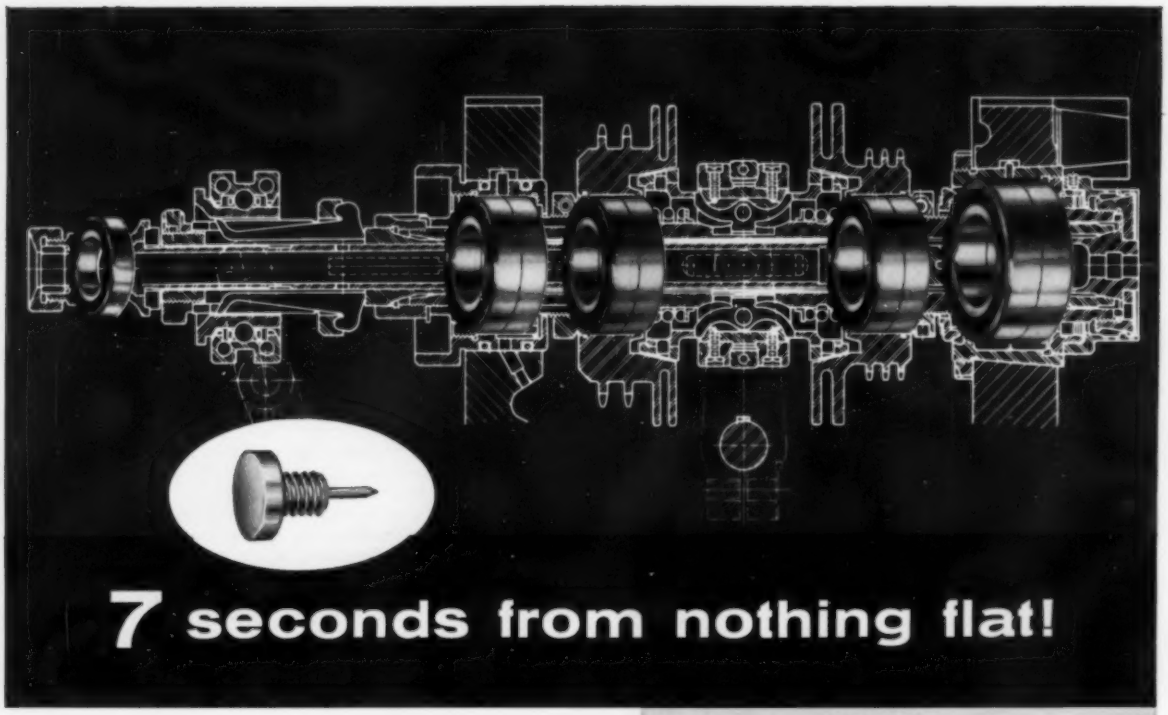
IN PRODUCTION

Edward Palczewski, Foreman of the Screw Machine Department (shown with operator), says, "We've been cutting aluminum during the ten years I've been with Leviton. We have one job running on a high-speed Davenport which does 120 pieces a minute. It consists of forming, drilling, tapping and threading 19/64-inch rod. We're running the machine at top capacity. Swaging diminishes the machinability of some metals—takes away their free-cutting qualities. Aluminum's properties are retained no matter what we do with it—doesn't get stringy or loose machinability. During setup, tools can be set dry. The operator can see what he's doing—saves a lot of time. Cutting oils are lighter, cheaper. Stock is easier to handle."

IN PURCHASING

Joseph Wolfson, Purchasing Agent, says, "Our Purchasing Department at Leviton demands dependability from suppliers. It is this simple fact that has characterized our relationship with Alcoa for over 15 years. Use of Alcoa Aluminum Screw Machine Stock has helped us to reduce our inventory and order problems; for example, one Alcoa alloy offers advantages of free cutting and free swaging. Once, when we increased production on a certain job and ran into low-stock problems, Alcoa's early delivery service really helped us out."

Your Guide to the Best in Aluminum Value



7 seconds from nothing flat!

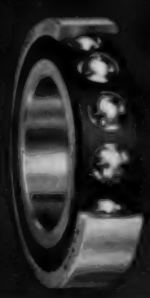
The brass part illustrated below the diagram is produced on the new 00 Brown & Sharpe Automatic Screw Machine in 7 seconds. That represents a 42% increase in production over the previous model.

To step up production by such a substantial percentage involved the development of new and exclusive features for the 00 machine over and above those proven so successful on the previous model. Included among them is the chain-driven, ball bearing spindle . . . see large diagram above.

In the selection and application of the bearings for the 00 spindle, Fafnir engineers worked with Brown & Sharpe engineers. The 208 speed combinations from a high of 7200 RPM to a low of 34 RPM, permitting high cutting efficiency on a wide range of materials, presented no ordinary problem for bearings. The bearing arrangement shown meets an exacting demand for maximum radial and axial rigidity to assure true balance and running accuracy of the spindle.

Could be there's no place in your machines for these super-precision bearings. But, whenever bearings are involved, there's certainly a place in your product planning for the Fafnir "attitude and aptitude" — a way of looking at bearing problems from the designer's viewpoint plus coming up with the right bearing to fit the need. Ask your Fafnir representative for details. The Fafnir Bearing Company, New Britain, Conn.

The New Brown & Sharpe No. 00 Automatic Screw Machine with Fafnir-equipped spindle.



Fafnir preloaded, angular-contact, super-precision ball bearings with composition or brass retainers are made to highest industry-approved tolerances. Single or duplex bearings like this are used widely on spindle applications.

FAFNIR
BALL BEARINGS
MOST COMPLETE LINE IN AMERICA

Technical Outlook

HOT FORGING DIE—Vanadium-Alloys Steel Co., Latrobe, Pa., reports it has developed a new die steel for forging high temperature alloys. Called "Jet Forge," it's a high chromium steel for applications requiring toughness, wear resistance and strength at elevated temperatures. Test dies that were run in plants making jet engine blades and buckets have shown up well.

NEW CLEANER— Sometime ago, Detrex Corp., Detroit, started a research project to develop an alkaline cleaner which would present no disposal problems and also provide in-process rust protection to cleaned parts. The company says its new Detrex 37 cleaner for spray washers (can be used cold) does both. Plant tests at Thompson Products Inc., Detroit, have been promising.

NEW REACTOR—The Experimental Boiling Water Reactor (EBWR) at AEC's Argonne National Laboratory, Lemont, Ill., started generating 5000 kilowatts of power (its full design rating) on Dec. 29, 1956. Its unique feature: Live steam is generated in the uranium core by nuclear heat and is piped directly to a turbine. There's no need for the intermediate heat exchangers required for other types of reactors.

AIR SPRING—The first to be used on an American passenger car is being made at U.S. Rubber Co.'s Indianapolis plant for the 1957 Cadillac Eldorado brougham. It's a rubber and nylon-fabric diaphragm which is fitted onto the open end of a metal air tank and held in place by air pressure. A metal piston for each diaphragm, self-regulating air valves and an air compressor are included in the system. One air spring is used at each wheel. The ride is smooth, and auto stylists can drop the height of cars without reducing ground clearance.

DESCALING TITANIUM— A chemical process for descaling titanium uses two immersion steps (one for scale conditioning and one for removal) and two rinsing steps. It uses relatively low temperatures (270 to 280°F), results in low metal loss (0.0001 to 0.0003-in. per side) and is inhibited to avoid hydrogen pickup and embrittlement. Turco Products Inc. Los Angeles, developed it.

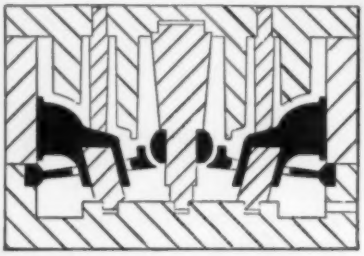
ELECTRIC WATCH—A power plant the size of a small shirt button turns the hands on the world's first electric wrist watch unveiled recently by Hamilton Watch Co., Lancaster, Pa. It's described by Dr. John A. Van Horn, Hamilton's director of research, as "a motor which keeps time . . . the most efficient small motor in existence." This milestone in timekeeping should find applications in today's trend to miniaturization to satisfy the demand for smaller instruments and devices of many types.

NEW BOLT STANDARD—According to one manufacturer, the new military specification (MIL-F-18240) for self-locking bolts and screws could spell "finished" for the lock wire in some parts of aircraft. Cost studies from part builders show that a lock wire adds about 8 cents per screw to assembly costs. Self-locking fasteners will be limited to service in temperatures of less than 250° F.

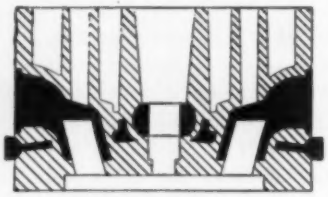
Metalworking Outlook—p. 31 *Market Outlook—p. 103*

SOLUBLE WAX CORES

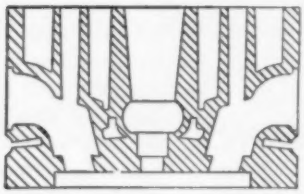
THE PATTERN FOR THIS COMPLICATED DIESEL CYLINDER HEAD WAS MADE WITH THE HELP OF SOLUBLE WAX CORES. ILLUSTRATIONS SHOW HOW IT WAS DONE



SOLUBLE WAX CORES LOCATED IN INJECTION DIE CAVITY



INJECTED PATTERN BEFORE DISSOLVING SOLUBLE WAX CORES



INJECTED PATTERN AFTER DISSOLVING SOLUBLE WAX CORES

Soluble Cores Aid Casters

For nonretractable cores, try a mixture of a soluble wax and powdered mica. Here's how Misco Precision Casting Co. uses the method to solve many complex problems

MOST investment casters at one time or another face the problem of nonretractable cores.

Charles W. Schwartz, technical director, Misco Precision Casting Co., Whitehall, Mich., told participants at the recent Detroit meeting of the Investment Casters Institute that any of three techniques may provide a solution:

1. Split section retractable metal cores. 2. Split section patterns which are fixture welded or cemented to form the whole pattern. 3. Water soluble wax cores.

Evaluate—Casters must consider all three methods before deciding on a final tooling design. The split section metal type can cause trouble: Wax in the parting lines. In most cases this can be trimmed in the pattern. The metal type is more useful on straight machined sections, although where difficult contours are encountered, it is hard to section a metal core for removal. Another trouble spot is in cored sections which are too small to subdivide for retraction.

Split section patterns which can be welded to form the whole are quite successful in both wax and plastic. In joining, a good seal is necessary to avoid penetration of the dip coat.

Alternate—Water soluble wax cores can solve many complex and difficult casting problems. Take the casting shown at left. It is a cylinder head for a diesel engine with four ports for the exhaust and intake manifolds. A complex, hollow cooling chamber was located around the lower section of the ports. To further complicate the problem, a spherical inner precombustion chamber was located in the center of the casting.

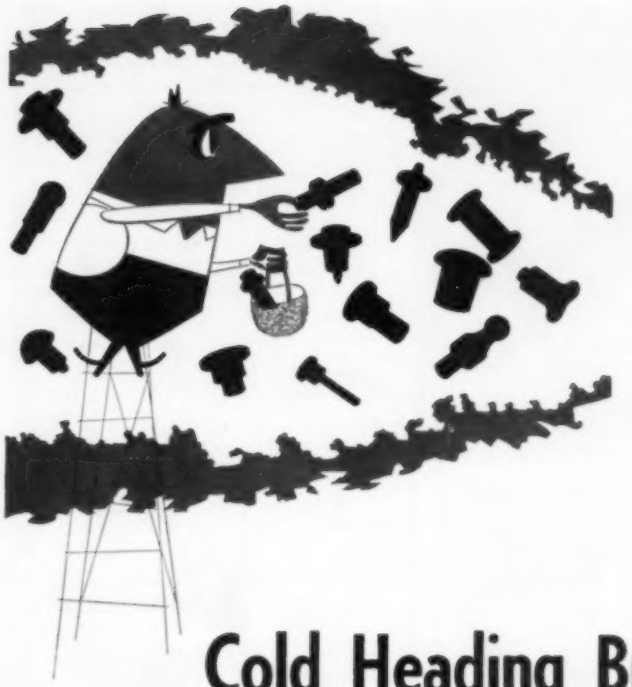
Brass inserts were used for the hollow sections where straight retraction was possible. In addition, six soluble cores were needed.

Properties — First efforts with water soluble waxes were concentrated on Carbowax materials. To correct early weaknesses, silica flour, aluminum powder, glass fibers and shredded asbestos were added as fillers. Most of those failed in early trials. Aluminum, for example, conducted heat too readily; when the pattern wax was injected, the core melted.

Mr. Schwartz says that the answer is powdered mica in Carbowax 4000, mixed in the proportion of 1/3 mica to 2/3 wax by weight. This formula was injected through an Alemite pump-type machine for the diesel cylinder head.

Temperature was kept at 150 to 155°F with the pressure between 1000 and 1500 psi. Silicone grease made a good parting agent. Dwell cycles during injection varied from 30 seconds to 5 minutes, depending on the injected core.

Solvent — The core can be dissolved by immersing it in a circulating warm water tank. Careful control of the temperature is necessary. A range of 90 to 100°F is considered best.



production ideas
NO. 7 OF A SERIES

The rule book has been thrown away. What is being accomplished with the process means savings and better products for users of small parts

Cold Heading Branches Out

COLD HEADING holds a bag of surprises. Manufacturers keep finding things the process can do that it never did before (and it has been around for over 100 years).

Right now it's the pet of the value analysts (and others whose job is to get things done better, faster, cheaper). There are two reasons: 1. The aggressive educational campaign that cold heading companies have been waging. (The word is getting around that cold heading has gone a long way beyond the standard bolt and rivet business.) 2. Positive values offered by the process:

- Controlled grain flow (giving high fatigue and shock resistance).
- Great material savings (little scrap).
- Configurations difficult to produce by other methods.
- Increased tensile strength through cold work.
- Close tolerances (0.001 in. on shank diameter and 0.005 in. on length are possible).
- Excellent surface finish (a 10 microinch finish is possible).
- High production rate (from 50 to 400 pieces a minute).
- Low unit cost.

Definition—The method is called "heading" because it started with the forming of heads on nails, and later on bolts, rivets and screws. It is done on specialized machines which form the part from wire or bar stock.

These machines perform three basic operations: 1. Cutting off. 2. Upsetting, to form a head or bulge. 3. Extrusion to form a diameter smaller than the wire stock. The simplest cold header forms a part in a single blow. Multiple blow headers have several forming stations and may have stations for trimming, pointing and thread rolling.

Stock Size—Until recently, 1 in. was the maximum diameter of stock that could be handled. That limitation has just been raised. A prototype 1¼-in. Boltmaker has been tested successfully at National Machinery Corp., Tiffin, O., and is about to be installed in Cleveland Cap Screw Co.'s new plant in Cleveland.

This machine, and supposedly others to come, will move cold forging farther into the area where hot upsetting takes over. The advantage will come from high grade products made at lower cost.

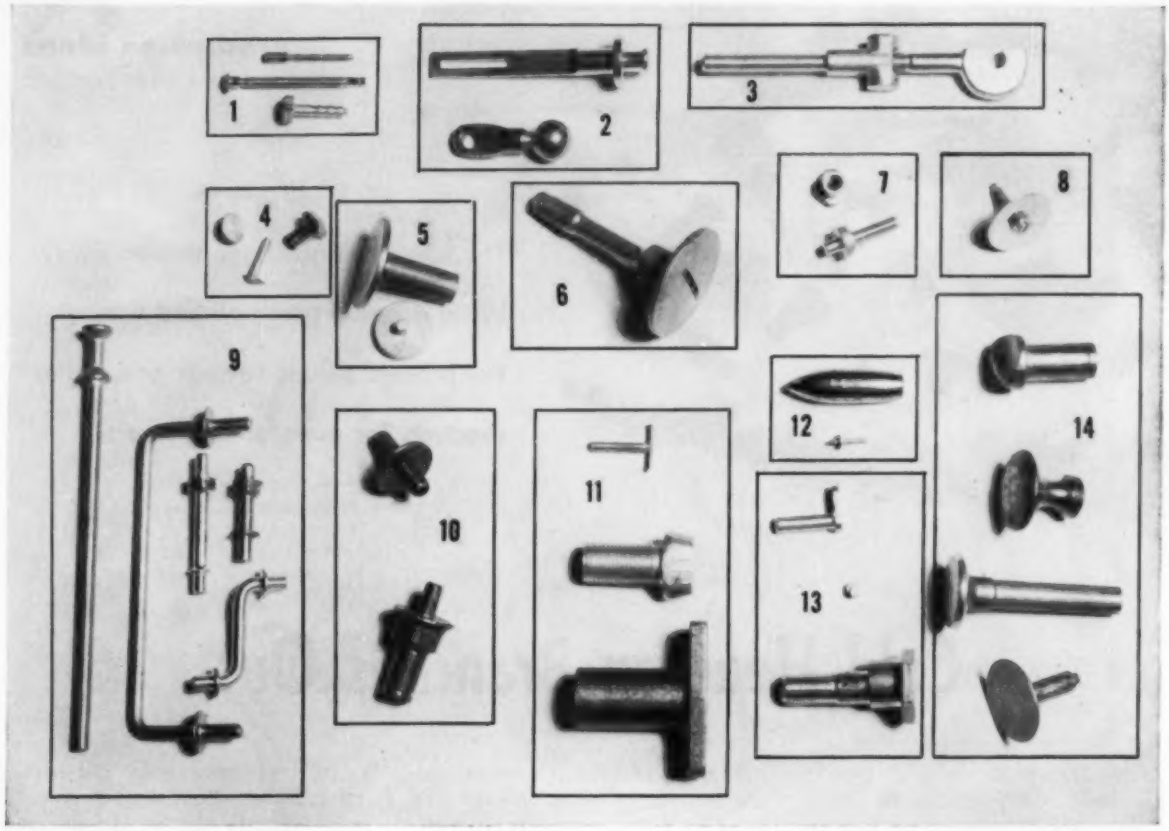
Specials — The Boltmaker will find its work cut out for it making 1¼ x 10 in. capscrews, but some day it could switch to making specials. Today, they're the hottest thing in the cold heading industry.

Many specials resemble standard fasteners. This creates a problem for the heading industry, which is trying to educate designers to other possibilities.

Savings—For example, take the pushbutton on a General Electric motor control. By stretching a bit you could call the button a shoulder rivet. It has a 1 in. diameter head which is concave on the face and tapers sharply in the back to a ¼-in. diameter shank. The shank, about ¾-in. long, ends in a short ⅛-in. diameter section.

The aluminum button had been made on a screw machine with an 89 per cent scrap loss. It is now being cold headed by Camcar Screw & Mfg. Corp., Rockford, Ill., from ⅛-in. wire at a saving of $22,000 a year.

Imagination — Ford Motor Co. stretched the process farther. Ford tractors have a shifting fork that resembles a bell crank. It has a cylindrical shank ⅝-in. in diameter and 1 1/3-in. long, which terminates sharply in a 1 in. diameter head. From the top of the head



Cold Heading Idea Clinic

1. Gears, worms, ratchets and shafts. 2. Automobile parts for a carburetor and rear view mirror. 3. Hose clamp, formerly two castings. 4. Decorative parts. 5. Big heads on small shanks. 6. Aircraft bolt meeting extreme specifications and tolerances. 7. Electrical apparatus parts. 8. Experimental electronic equipment part with extremely thin head section. 9. Double heads (bends are a secondary operation). 10. Centered heads and flanges. 11. Side extensions for electrical apparatus and appliances. 12. Ordnance parts. 13. Offsets and eccentrics. 14. Knobs and pulls. (All parts cold headed by Camcar Screw & Mfg. Co., Rockford, Ill.)

an arm shoots off to the side at a steep angle for 2½-in., and ends in an oval projection parallel to the shank.

It looks like a natural for a malleable casting or hot forging. Cleveland Cap Screw beats the costs of both by cold heading the parts on a standard open die machine.

Why Cold? — Ordinarily you'd expect the strength necessary in such a part to be achieved through high strength material and heat treatment. By taking advantage of controlled grain flow and strength build-up through cold work, Cleveland Cap Screw is able to make the part from low carbon steel wire.

There's another angle. Ford buys the trimmed cold headed blanks and finishes the parts. Where extensive machining is needed or manufacturers have open finishing capacity, they sometimes find it pays to do the finishing themselves.

Finish — However, companies that do cold heading ordinarily have banks of special purpose machines for such secondary operations as shaving, pointing, undercutting, threading, slotting and drilling. They can do these routine jobs cheaply because they are set up for mass production.

Starting a machining operation with a cold headed blank can produce real savings. This is especially true with premium materials, such as titanium, where scrap losses are intolerable.

Scrap—Low scrap loss is one of cold heading's biggest selling points. Part of the reason, of course, is that the process moves metal instead of removing it. Even in open die work there is virtually no flash. Threads, knurls and splines can be rolled, further cutting scrap and getting the benefits of cold forging in the rolling operation.

Scrap reduction goes back to the wire stock, which must be free from pipe, nonmetallic inclusions, segregation and seams. The wire is drawn to closer than commercial tolerances, and is usually annealed or spheroidized and coated with a lubricant. The result is a material of excellent flowability which will take severe cold work without cracking or opening up.

Materials—Virtually any material that can be cold worked can be cold headed, although materials that work harden rapidly are poor choices. With steels, it's a good idea to limit carbon to about 0.45 per cent. Many alloys, including

chrome nickel, chrome moly and several grades of stainless, head well. Silicon bronze, Monel, brass, copper and aluminum are good cold upsetting materials. Although wire of round cross section is the usual starting point, shaped wire could be used.

The minimum number of parts for an economical cold heading run depends on design and the cost of alternative processing methods. It might be 5000 or 50,000 pieces. The cost of setting up can usually be paid off in one day's run, which would be about 25,000 pieces for a fairly large part.

Limits—One of the biggest problems cold heading has to contend with is a mythical rule of thumb: "A length of wire stock 4½-times its own diameter is the most that can be upset." Hogwash! say any number of cold headers, who cheerfully make upsets of twice that much material and more. Sixteen diameters have been successfully cold headed.

The size of the upset depends on so many things—such as material, machine condition, manufacturer's know how and number of heading operations—that there's only one good rule of thumb to follow: Ask companies that do cold heading to show what they can do with your designs.

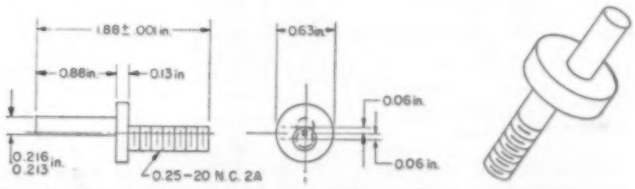
Leeway—If you tell them how your part is going to be used, they can do a better job of fitting it to cold heading techniques. Here are design features you can logically expect cold headers to produce, either singly or in combination:

1. Heads or collars located anywhere on the shank.
2. Heads and collars of concentric or eccentric shape, with faces parallel or at an angle to the shank.
3. Stepped shanks.
4. Hollows or projections parallel to the shank axis.
5. Rolled threads, knurls and splines.
6. Points and tapers.
7. Secondary operations such as shaving, trimming, drilling, flattening, punching, bending, tumbling, plating and heat treating.

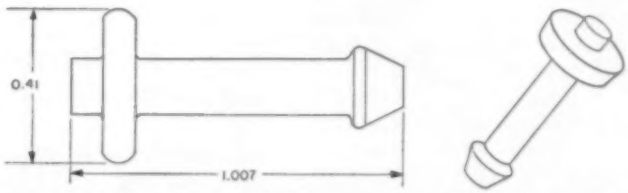
Reminders—Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y., makes the following suggestions for greatest economy:

1. Concentric formations are

You don't often see a part like this made by cold heading. It's a shifter fork for a Ford tractor. Cleveland Cap Screw Co., Cleveland, produces the trimmed blanks from low carbon steel wire on standard cold heading machinery, and Ford finishes the part

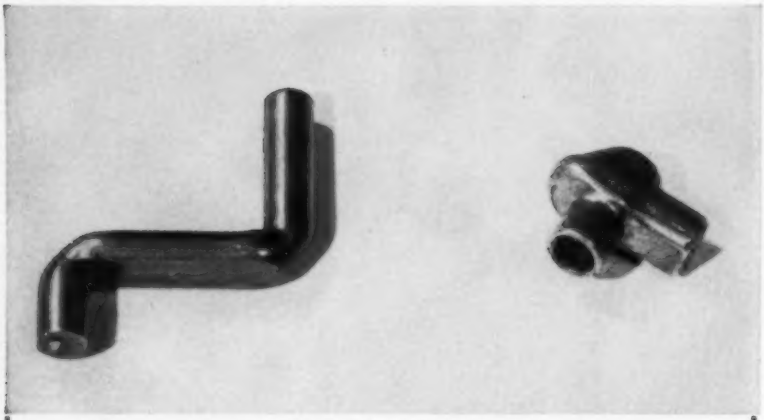


This small eccentric cam was originally made as a precision casting at a tooling cost of $2200 and a part cost of 19 cents. H. M. Harper Co., Morton Grove, Ill., reduced tooling cost to $220 and produced the part for 9 cents each, using cold heading

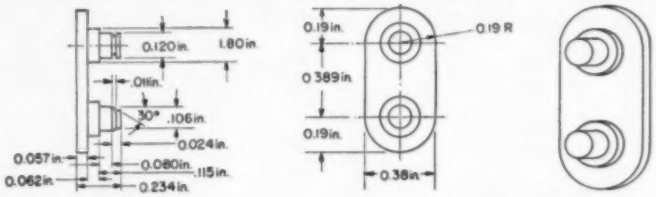


A two piece insert for a rubber grommet cost too much and was doing an unsatisfactory holding job. John Hassal Inc., Westbury, N. Y., now makes the part by double heading at a saving of $8.80 a thousand over the former method, a 63 per cent saving

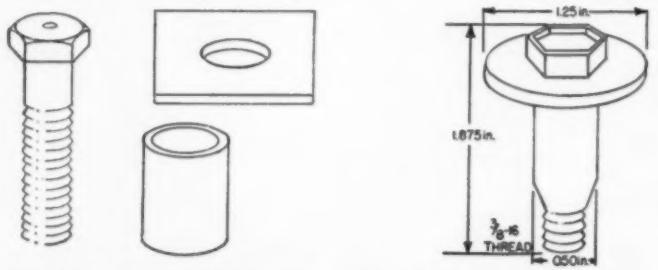
This idea-jogging collection from Chicago Rivet & Machine Co., Chicago, is intended to suggest some of the decorative as well as functional uses to which rivets can be put. Embossing, numbering, etc., can often be done as an integral part of the heading operation



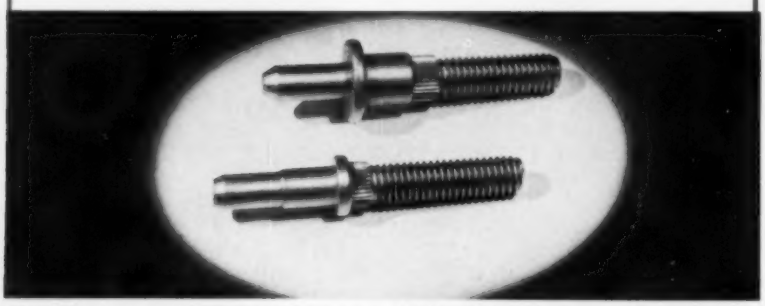
Cutting corners with cold heading machinery is standard practice at Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y. The crank-like shifter interlock lever is made in one operation. The cable connector was formerly a casting. Holes are drilled later



Milford Rivet & Machine Co., Milford, Conn., didn't know it was possible to form a hinge of this type from a single length of round wire—until it went and did it. It replaces a three piece assembly at a considerable cost saving



This three piece assembly consisting of a hex head bolt, square washer and tubular spacer was hand assembled and brazed before Townsend Co., New Brighton, Pa., redesigned it for cold heading, with annual savings of $25,000 (a 50 per cent cost reduction)



The lightning arrester part above was cold headed in a seven step operation which included heading, pointing, shaving and rolling. Pheoll Mfg. Co., Chicago, came up with the lower design which does the same job and can be made in two operations. The savings? Well over $100 per 1000 parts

easier to handle than off-center or eccentric sections.

2. Sharp corners are difficult to fill. Allow generous radiuses if possible.

3. Oval or round shapes require less trimming than square or rectangular sections.

4. Hollow upsets cause more die maintenance, and cracks may form around the edges of the recess.

5. Lettering or embossing is expensive.

6. Large sections with flat undersides are easier to remove from a die when there are concentric ridges on the underside.

7. Cold heading becomes more expensive as the amount of carbon in the steel increases.

Ahead — So many jobs which "can't be cold headed" are being done that the future looks exceedingly bright. Titanium, Inconel, AMS 5616, AMS 6304 and SAE 52100 are representative of tough alloys being headed now and a hint of things to come.

Moving up is "warm heading," done just below tempering temperature. It's a valuable way of getting cold work strength into hard-to-deform materials. Development of fast heating techniques will give it added importance.

Some of the newer types of machinery—the cold nut former, for example—broaden the picture for specials. Even greater advances seem to be coming in stretching the capabilities of forming machinery of conventional design.

Look—To take advantage of the increasing abilities of cold heading, look for these things:

1. Assemblies that might be made in one piece.

2. Machining and forming that heading could eliminate.

3. Items that could be reduced in size by taking advantage of cold work strength.

4. Small parts now cold or hot pressed from prepared slugs.

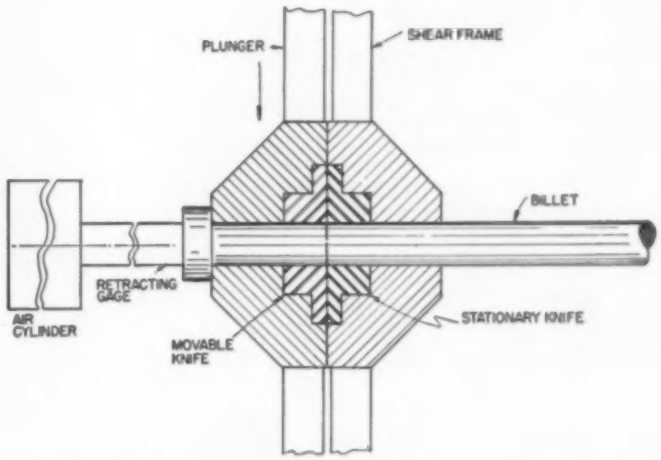
5. Small gears and cams on shafts.

6. Parts with holes or recesses in the end, preferably not deeper than three times the diameter.

7. Parts requiring a fine surface finish.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, O.*

It's the fastest way to produce billets for hot forging and cold extrusion. Ends are square; blanks can be gaged to length accurately and automatically



Confined shearing principle. Drawing shows a solid, circular cutting die. For softer materials and pieces shorter than the diameter of the bar, a more complicated split die is recommended

Shearing Squares Up Billet Ends

By W. C. TUCKER
Chief Engineer
Buffalo Forge Co.
Buffalo

MOST commercially sheared billets have one end which is square. The other end is out of square by a slight angle.

This is because the pressure of the upper shearing knife causes the overhung portion of the billet to bend downward slightly up to the instant of fracture. The drop-off piece has one end that is out of square by the same number of degrees that the billet was bent from the horizontal.

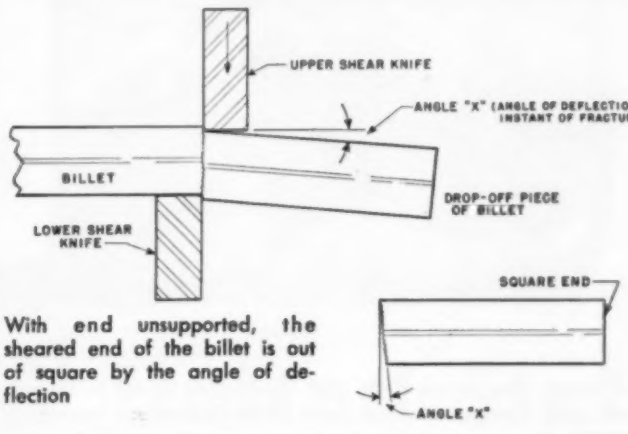
A Need—There is increasing demand for billets that are really square on both ends. They especially are needed where the blanks are to be pierced or upset in a vertical press operation, or extruded. It is becoming necessary for the blank to stand on end in the press die or on a furnace conveyor.

Square surfaces on both ends of a sheared blank can be obtained by providing a positive level support for the blank while it is being sheared. If the blank cannot sag or bend under pressure, it will be parted along a truly vertical slip plane.

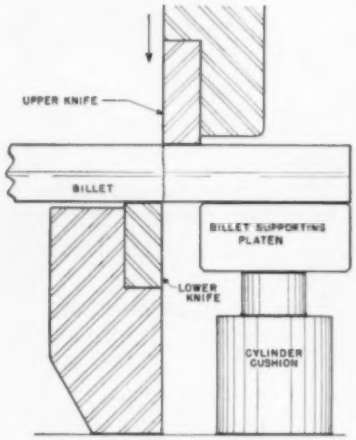
Gaging—Accurately maintained uniformity of weight in each blank is a matter of positive gaging. Air-operated retractable gages do this job easily.

The gage cannot compensate for billets that do not run true to standard size or those which are severely scarfed at the mill. Gages must be adjusted to allow for such conditions.

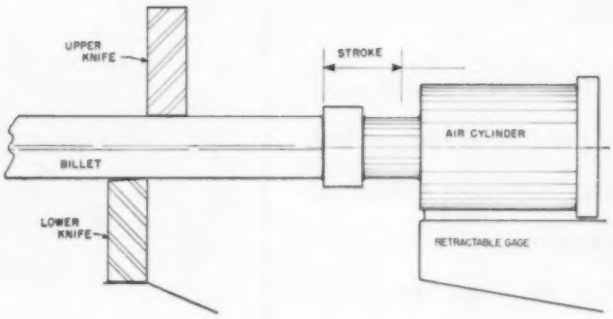
Cold Extrusion — Most steels used for cold extrusion are in the low-carbon range which makes them easy to work and relatively easy to cut into blanks. Squareness and smoothness of the cut



With end unsupported, the sheared end of the billet is out of square by the angle of deflection



Use of a support platen keeps billets from bending under knife pressure on long cuts and medium size bars



Retractable air gage determines length of slug cutoff

have a direct bearing on the success of extrusion.

Gage supports are practical on relatively long cuts and medium size bars. But they cannot be built strong enough to take the pressures exerted when short pieces are sheared, especially in large square and round billets. The best solution here is the "confined cut method."

How It Works — The process uses a split shearing die. Half of the die is held stationary in the shear frame. The other half, which contains the moving knife, is mounted in the shear plunger.

The piece is fully confined on both sides of the slip plane during the shearing cycle, so both ends of the blank are square.

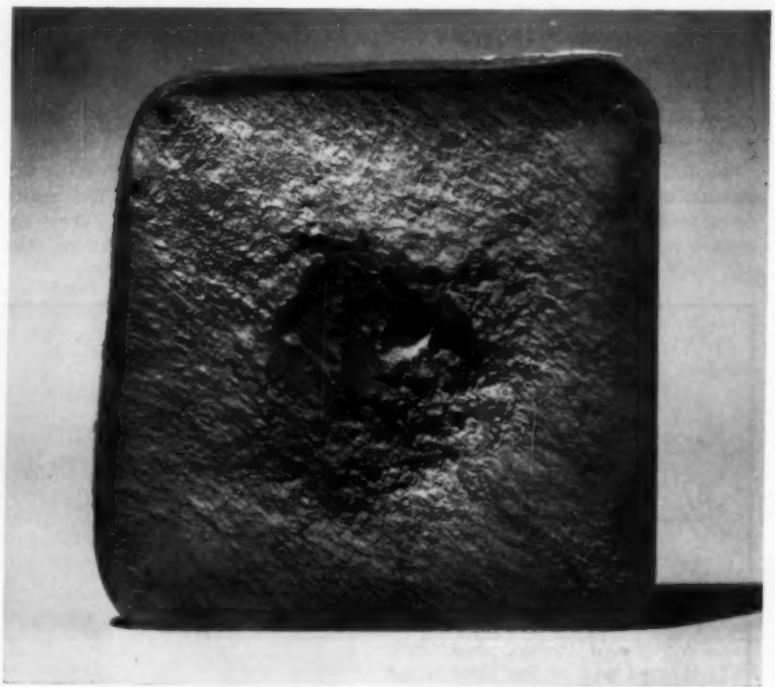
Buffalo Forge is still working on this process, and it promises to be successful for a wide range of materials, particularly the softer ones, where the minimum amount of distortion is required and end squareness is a must.

Shear Fracture—To those unfamiliar with the mechanics of shearing steel billets, it seems to mean a knife cutting through the full cross section, severing every portion of the metal with its cutting edge.

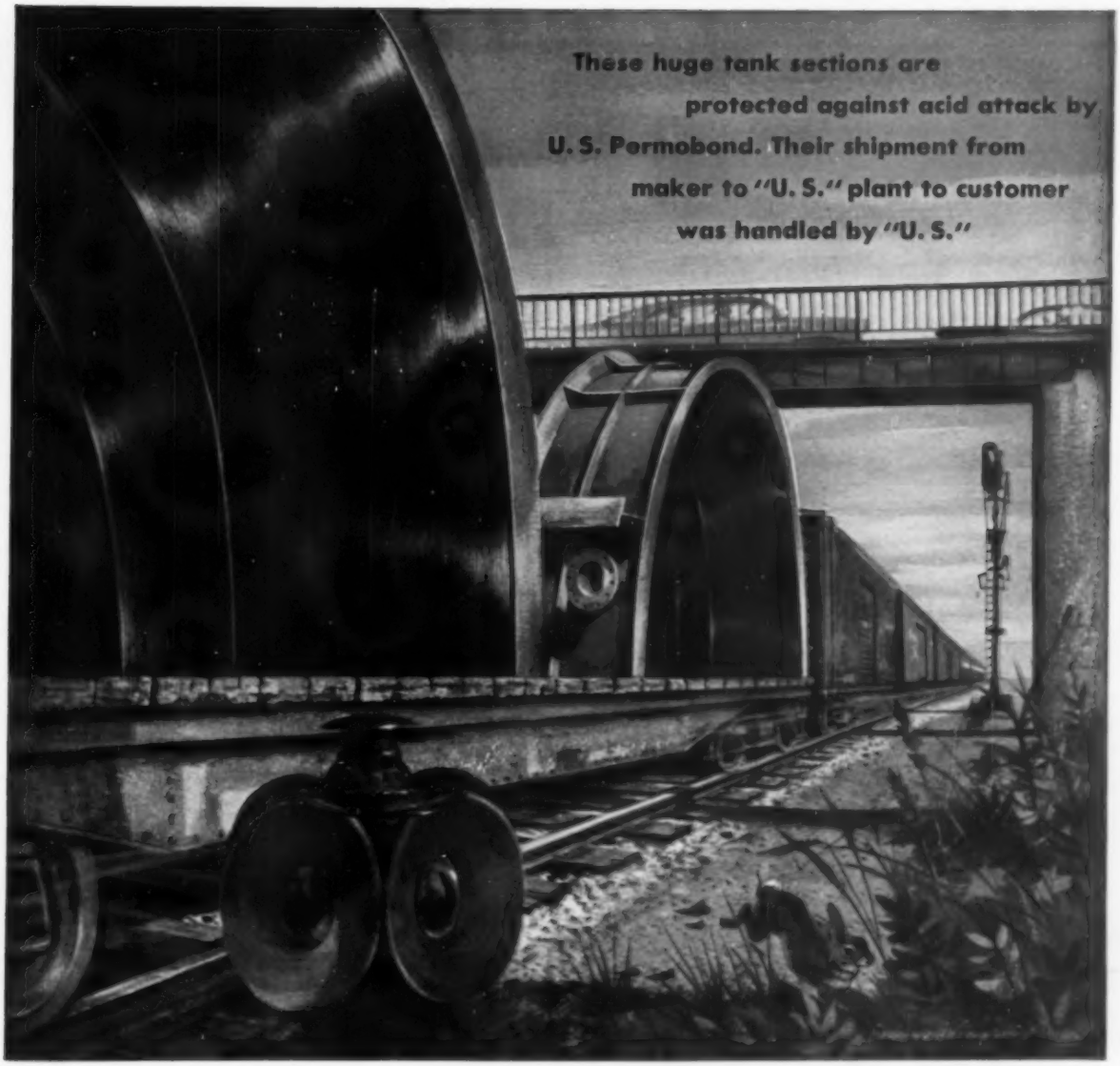
This misconception has led to the belief that the surface of separated ends are smeared by the knife, making it impossible to observe porosity, inclusions or "pipe."

No Smearing — Observation proves this erroneous; shearing enhances visible inspection. When shear stress is imposed on a billet, the two parts are divided along a slip plane, separating the grain of the material clearly along relatively smooth surfaces.

The pressure of the knives will reveal any porosity at the center of the billet and open the pores so they are easily detected.



Cross section of 4 in. square SAE 1050 steel billet, known to be porous at the center. The shearing stress has shown the roughness and tearing tendency at the center


These huge tank sections are
protected against acid attack by
U. S. Permobond. Their shipment from
maker to "U. S." plant to customer
was handled by "U. S."

The expansion plans of a chemical plant called for the design of a processing tank that was so huge it could not be shipped in one piece.

So the steel fabricator's engineers, working with "U. S." engineers, designed the tank in 2 parts. The tricky task of transporting these immense sections from the fabricator to the "U. S." plant (where U. S. Permobond protective linings were installed) and from there to the chemical plant was *arranged* by "U. S." traffic specialists. When the 2 sections arrived at the chemical plant, "U. S." field service men vulcanized the joints after the halves were welded together, making a complete rubber lining with no seams or joints. Thanks to the Permobond® lining, the tank is immune to acid attack.

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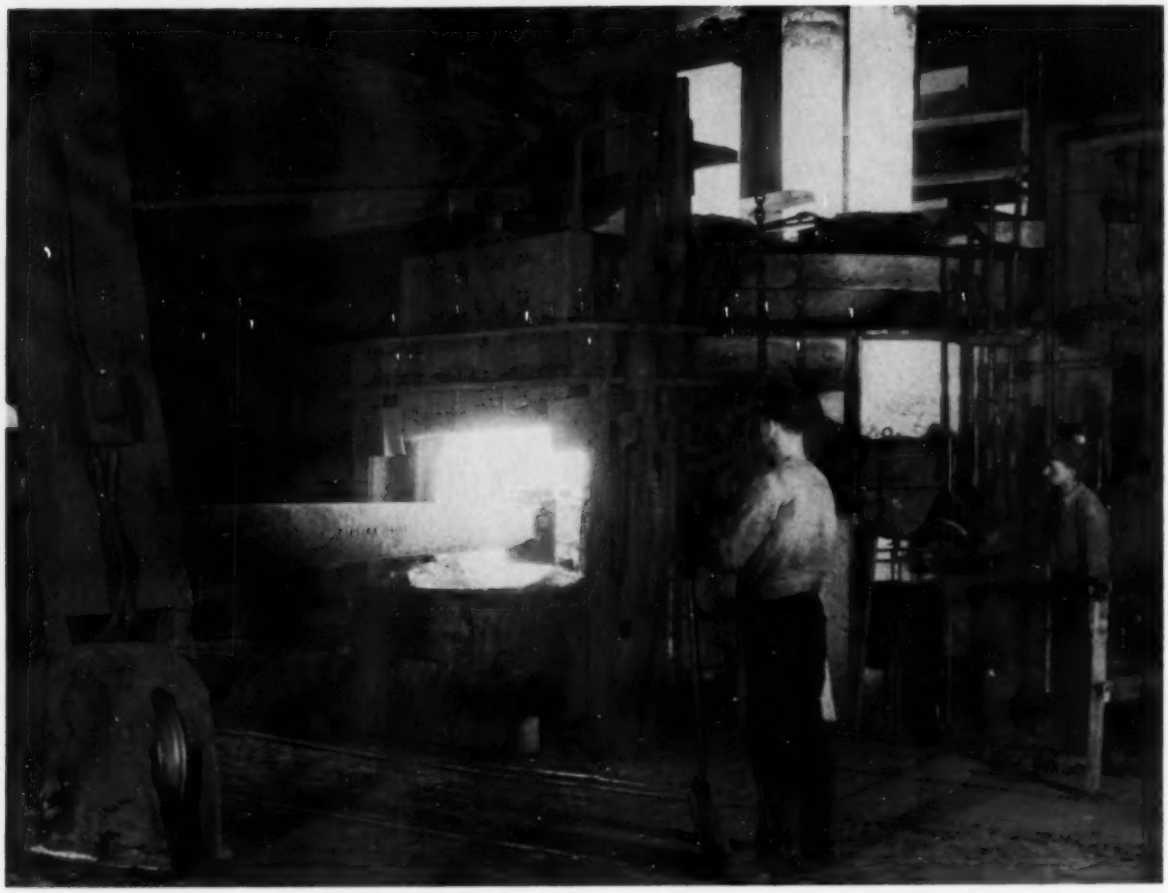


Scrap, Ingots, Smoke and Silicon

Electric furnace steelmakers, meeting in Chicago, hit hard at today's problems with an eye on a bright future. Here are highlights of the AIME program

WHAT'S going to happen to scrap prices?

Chapin Hoskins, chairman of the Institute of Trend Research, Hopkinton, N. H., detects three types of waves in scrap prices:

1. Minor ripples, often showing a seasonal or semiannual character, and measurable in weeks.

2. Major waves obviously associated with the coming of war and peace and extending over many years.

3. An in-between class of waves (the "operating cycle"), lasting from two to four years. Each operating cycle is divisible into four phases with the characteristics shown in the specimen cycle. It begins with the price of scrap lower than a year earlier, crests with the price higher than a year earlier and ends with the price again lower than the year before.

Meeting—Mr. Hoskins described the cycles at the annual Electric Furnace Steel Conference of the AIME in Chicago last December.

The Institute of Trend Research has been conducting the scrap price study since 1948 under the sponsorship of Lukens Steel Co., Coatesville, Pa. Mr. Hoskins made no claim that it is possible to predict when scrap prices will rise and fall, and how much, but the inference was there.

Rate of Change—The progress of a cycle can be charted by its rate of change over a standard

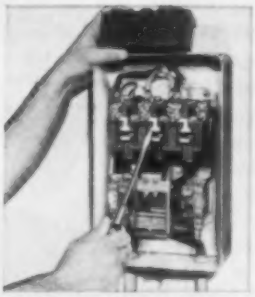
Here's Why We Specify
SQUARE D Starters
on the Machinery We Buy

PERFORMANCE, EASY INSPECTION AND MAINTENANCE

Sure, we like Square D performance because it keeps our "down time" at a minimum. BUT—everybody knows that even the best starter needs periodic inspection and preventive maintenance. We like the way Square D makes it easy to handle those routine jobs.

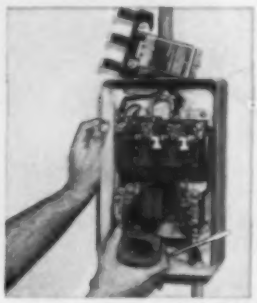
OFF-THE-SHELF PARTS KITS

They make normal maintenance and modifications easier than ever. Packaged parts include interlocks, contacts, coils, overload relays, pushbuttons and selector switches. They're easy to buy, easy to identify, and faster to install.

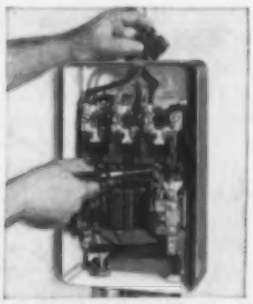


1 Loosen two screws and the arc chamber cover comes off. Every contact surface can be inspected at a glance.

2 Remove four screws and entire movable assembly can be lifted off. Disconnect two wires and slip off magnet coil.



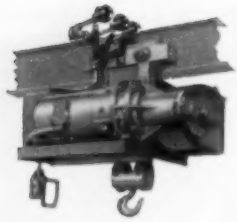
3 Contacts are attached with separate screws—they can be removed and replaced without disturbing any wiring. A screwdriver is the only tool needed.



4 Sizes 0 through 4 starters have these separate mounting electrical interlocks for easier installation. Contact block is attached from front of panel with two screws.

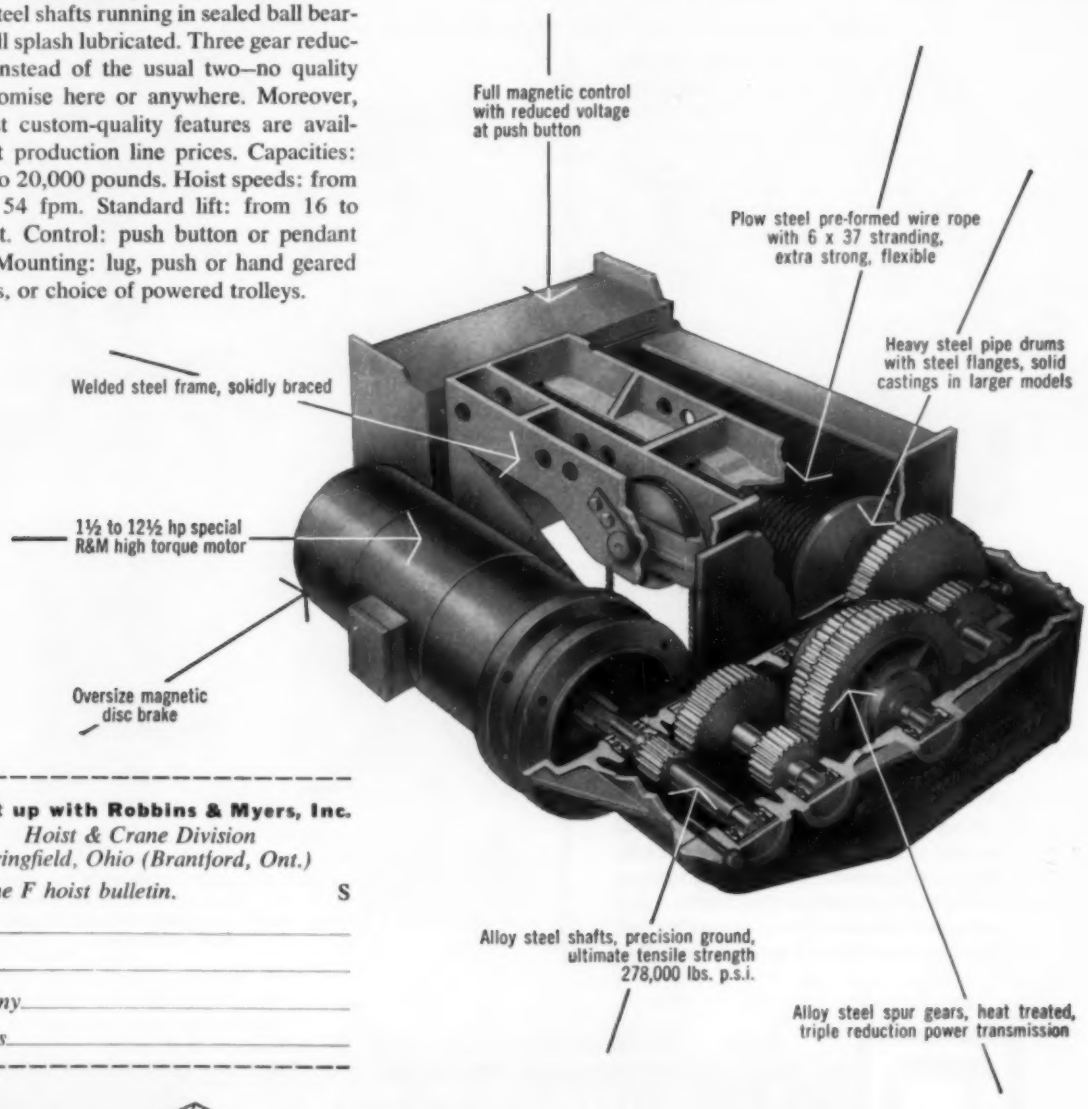
NOW...EC&M PRODUCTS ARE A PART OF THE SQUARE D LINE!

SQUARE D COMPANY



R&M F hoists cut down the cost of lifting but the F hoists save still more money. Dollars usually spent on maintenance become dollars earned because of the extra stamina built into each component. Look at the gearing—here are precision cut alloy steel spur gears, wide faced and heat treated for durability. They're mounted on alloy steel shafts running in sealed ball bearings, all splash lubricated. Three gear reductions instead of the usual two—no quality compromise here or anywhere. Moreover, F hoist custom-quality features are available at production line prices. Capacities: 1000 to 20,000 pounds. Hoist speeds: from 10 to 54 fpm. Standard lift: from 16 to 40 feet. Control: push button or pendant rope. Mounting: lug, push or hand geared trolleys, or choice of powered trolleys.

choose a hoist with extra stamina


Full magnetic control with reduced voltage at push button
Plow steel pre-formed wire rope with 6 x 37 stranding, extra strong, flexible
Heavy steel pipe drums with steel flanges, solid castings in larger models
Welded steel frame, solidly braced
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Alloy steel shafts, precision ground, ultimate tensile strength 278,000 lbs. p.s.i.
Alloy steel spur gears, heat treated, triple reduction power transmission

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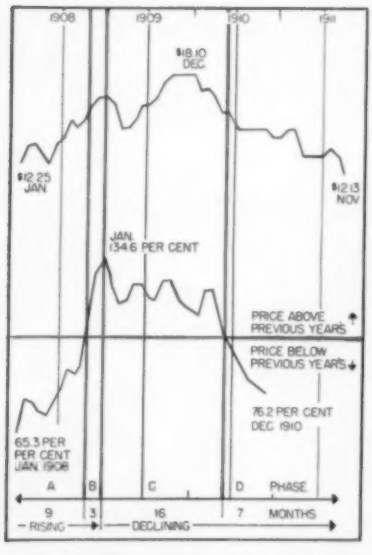
period (12 months, for instance) by dividing each month's average scrap price by the price for the same month in the previous year (see the chart).

The length and amplitude of each phase are influenced by the previous phases according to a pattern that can be determined from a comparison of many former cycles. Thus, there appear to be definite laws governing cyclical change.

How such laws can be employed to chart the future of electric furnace steelmaking was a frequent topic of conversation at the AIME meeting. With another peek at history (surveys of European and American electric furnace practice in acknowledgment of the 50th anniversary of the art) the conference moved on to newer things.

Ingots — B. R. Queneau, chief metallurgist, Duquesne Works, U.S. Steel Corp., drew interest with his remarks on inoculation of molds with ferrochrome powder to promote uniform grain growth in stainless steel ingots. The nucleated ingots showed no between-grain shrinkage. It was evident from the session that the lessons of foundry practice are being applied to ingot improvement.

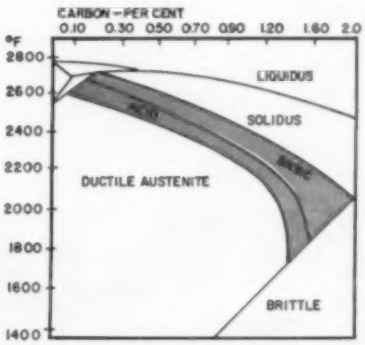


Sample scrap price cycle (above) with its corresponding rate of change (below). Rate of change is determined by dividing the scrap price for each month by the price for the same month of the previous year

C. F. Christopher, director of research, Continental Foundry & Machine Division, Blaw-Knox Co., East Chicago, Ind., also turned to foundry experience in his paper on "Relationship of Freezing Characteristics to Hot Tearing and Deoxidation." He pointed out that hot tearing is only one of several related defects that occur before the cast steel has completely frozen (the others: Pipe, flow lines, shrinkage).

Hot Tearing—His work shows that there is a time-temperature band of embrittlement which is unavoidably produced by freezing phenomena. The band occupies a 100 to 500°F range before the metal completely solidifies (around 2400°F). The width of the band is determined by carbon content, with highest carbon showing the widest embrittlement band (see the diagram).

In a casting such as a roll with



Hot tearing range (shaded) superimposed on a generalized constitutional diagram

intricate surface contours, hot tearing is controlled by gating and heading and the use of chills to dissipate the cooling stresses. Since hot tearing results from mechanical weakness around the grain boundaries, the relationship of deoxidation practice to grain boundary precipitation also is being studied. One important conclusion: Furnace operations in steelmaking must favor high oxidizing systems and a temperature control that will permit the weakest deoxidation possible.

Smoke—Fume control is one of the most important problems facing the electric furnace builder today, according to Samuel Arnold III, consulting engineer, Pittsburgh. He pointed out that while a number of furnaces have already been provided with fume removal equipment such as hoods, one unfortunate feature of them is the difficulty of properly holding reducing slags with a slight negative pressure in the furnace.

C. W. Finkl, plant engineer, A. Finkl & Sons Co., Chicago, a company that has equipped two 20-ton furnaces with fume control, reports an unexpected benefit: Hoods change the noise level in the melt shop by accentuating the lower frequencies and diminishing the irritating high frequencies. The shop is also a cleaner and safer place to work, although no way has yet been devised to collect the smoke during teeming.

Silicon—Looking ahead to the day when the economics of electric steelmaking may require the use of a large hot metal charge, S. L. Case, technical adviser, Battelle Memorial Institute, Columbus, O., said: "One of the important stumbling blocks in such an operation is the high silicon content of the charge when the ratio of hot metal to scrap is 1 to 1 or higher.

"Desiliconization of hot metal electric furnaces will probably be considered a must in the near future, when operation of electric furnaces on a high hot-metal charge may be expected to become common practice in integrated steel plants. Costs of desiliconization are estimated to range from $1 to $2 per ton of hot metal. This would be compensated many fold by savings in lime, electrical energy, electrodes and increased furnace output."

General Electric Co. is forecasting a growth in arc furnace production of carbon steel of 1 million tons a year for the next 20 years. Alloy steels will add another 5 million or 6 million tons by 1975, predicted R. Bry, manager, transformer products sales, General Electric Co., Pittsfield, Mass.

Higher electrode speeds will be coming into the picture at the same time. Mr. Bry believes that electrode speeds up to 20 fpm will be practicable. Several high speed drives are already in service.

TOMORROW:

A standard motor that can

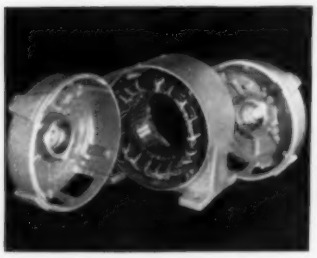
The new Life-Line A is another step closer

One of the principal causes of motor failure today is overloading. Right now Westinghouse is working on motor designs that will someday result in a motor that can survive any overload.

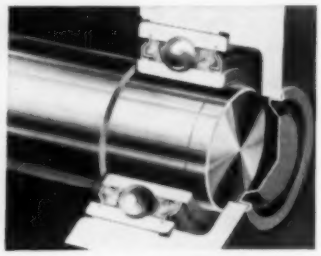
This picture shows a 15-hp Life-Line "A" motor pulling a quarter of a million pounds of locomotive on New York Central tracks near Buffalo. It's simply a dramatic way of showing the progress Westinghouse has made toward better overload protection. Improved insulation, frame construction and bearing design give the Life-Line "A" better protection against overloads than ever before. It's industry's closest approach to a standard motor that can withstand any overload condition.

Your Westinghouse sales engineer is ready to tell you about many other reasons why the Westinghouse Life-Line "A" is industry's most advanced and preferred motor. Call him today.

J-21925



New exclusive Bondite* impregnating varnish, partner to new Bondar* and Mylar† insulations, guarantees complete resistance to the heating effects of heavy overloads as well as motor contaminations.



Exclusive Life-Line "A" prelubricated bearing features a new 4-way seal and completely excludes the three main causes of bearing failure: (1) contamination, (2) overgreasing, (3) wrong grease.

*Trade-Mark †Du Pont Registered Trade-Mark

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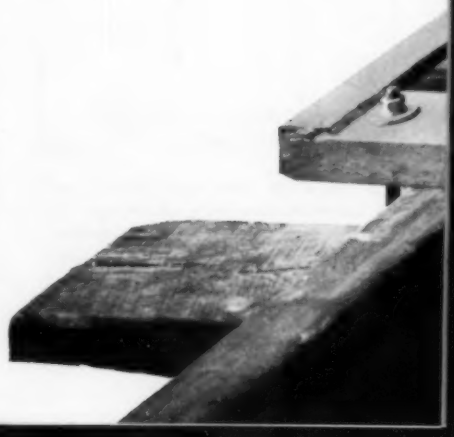
*WHERE **BIG** THINGS ARE HAPPENING **TODAY!***



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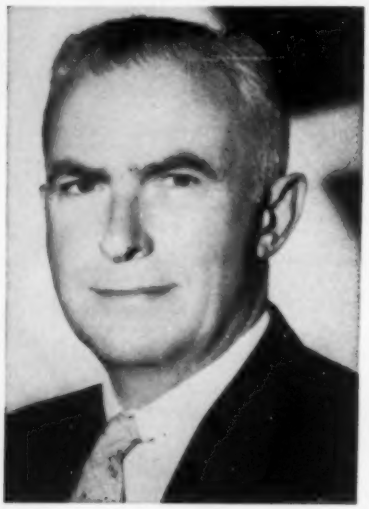
Carbides To Gain in '57

A faster metalworking clip in both civilian and defense operations will boost sales this year, says one carbide maker. Also, he says, watch for manmade diamonds

METALWORKING will consume between 7 and 9 per cent more cemented carbides in 1957 than it did in 1956. That's the opinion of K. R. Beardslee, general manager of General Electric's Metallurgical Products Department, Detroit.

Mr. Beardslee credits the boost to an anticipated acceleration in defense spending, plus a faster industrial pace due to plant expansions. Since 1950, the increase has been 5 to 8 per cent yearly.



"More defense spending and . . . plant expansions will accelerate carbide's growth rate this year." K. R. Beardslee

Over-All — According to Mr. Beardslee, this year will bring an over-all increase of 16 per cent in his department's sales. They include magnetic materials, specialty resistors, vacuum-melted alloys and the carbides.

He also hints that rapid strides in process development work on manmade industrial diamonds may make this product commercially available sooner than anticipated.

Stabilizers

Machine tool builders continue to express optimism about 1957. They are encouraged by the promise of a high level of new orders and their ability to ship at a rate that will keep deliveries realistic for the buyer.

The biggest news in the industry is its new-found stable business cycle (STEEL, Dec. 31, 1956, p. 66). A recent bulletin from the National Machine Tool Builders' Association suggests that there are signs of continuing stability in widespread industry orders and in the Defense department's plans for realistic replacement.

The bulletin says: "No one particular industry, or no one major industrial segment, contributed in particular to the sustained volume of machine tool sales" in 1955 and 1956.

"Continuing orders reflected the expansion plans of industry in general, requiring new machines for new plants, but reflected to an even greater extent the growing realization throughout all metalworking that obsolete machines must be replaced."

The association also comments on the directive promulgated Dec. 12 by the Defense department which covers definitive policy to make annual replacement of obsolete machine tools. It calls for annual budgets from the military departments amounting to 2 to 5 per cent of the acquisition cost of all machine tools carried in inventory. The obvious weakness is that this plan sets the retirement age for machines at 20 to 50 years, which is scarcely realistic if the departments are as concerned about obsolescence as they are about sheer fatigue. But, the builders say, it's better than no plan at all.

Fast Part Assembly

Hydraulic press rivets stampings to die-cast hubs at rate of over 300 an hour

ALL automatic washers made at the St. Joseph, Mich., plant of the Whirlpool Corp. have stamped steel brake discs produced in a progressive die.

The stamping is drawn into a shape resembling a dish with a wide flat rim. In the bottom of the stamping is a large splined central hole and four small holes.

Hub—To mate with the stamping, the company purchases flanged zinc alloy hubs which are die-cast. Each has a cored splined hole at the center to match the central hole in the stamping. Around the cast flange are four integrally cast rivets which fit into the small holes in the bottom of the stamping.

PUNCH
. . . heads four rivets simultaneously

When the two parts are put together, the rivets project inside the dished portion of the disc. It is necessary to head the four rivets to fasten the brake disc permanently to the hub.

Tooling — To do this, the two parts are set into a fixture fastened to the bed of an 8-ton Denison hydraulic press. The press punch has four projections spaced in line with the rivets to be headed.

When the press is closed, the four punches head the four rivets simultaneously. A spring loaded stripper on the punch seats the stamping firmly against the casting before the rivets are headed.

Hydraulic operation avoids striking a sharp blow, but the pressure applied is ample to head the rivets properly. As soon as heading (at the preset load) is completed, the ram retracts automatically.

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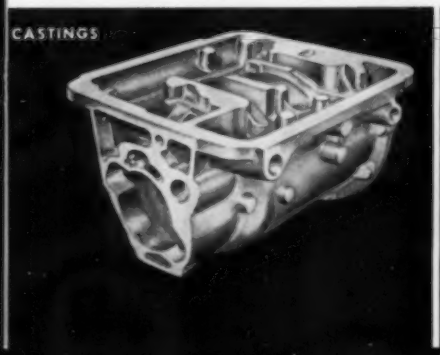
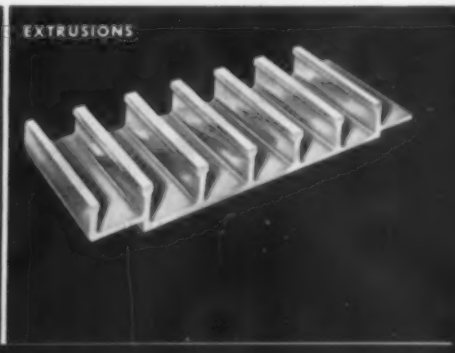
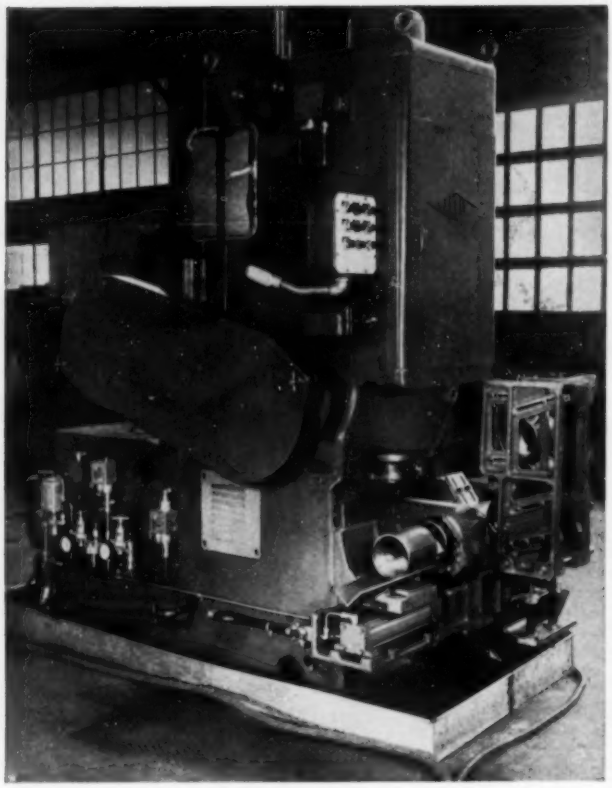
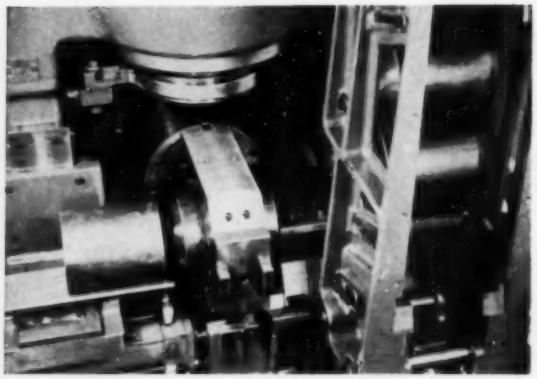
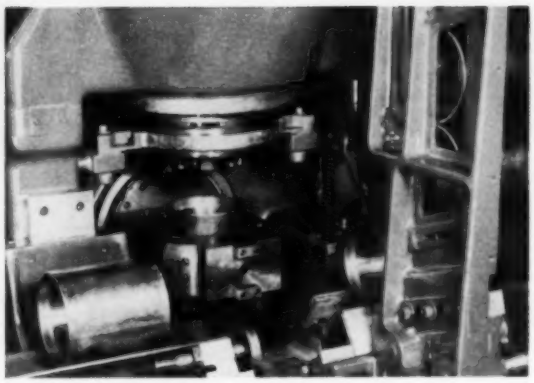










Parts on this machine feed from the magazine, through a transfer into the chuck jaws (upper right.) Picked up by the chuck, they go into the machine and are indexed 90 degrees into tapping position (lower right). A 180-degree index sets up the other end

Coupling Tapper Boasts Automatic Cycle

PIPE COUPLINGS flow through the above machine at rates up to 96 an hour. The machine taps straight or taper threads in both ends of the parts.

Designed and built by Landis Machine Co., Waynesboro, Pa., several of the machines already are in production. One company has ordered nine more machines.

Dubbed the 48T coupling tapping machine, it threads pieces ranging from 1¼-in. external upset tubing to 6-in. OD casing.

Flow — Parts move to the machine through a gravity-feed magazine that holds about a 20-minute supply of the large pieces shown. The magazine can be adjusted to any size coupling within the range of the machine.

An air operated transfer pushes parts from the magazine into the chuck. While the transfer is loading one part, the others in the magazine stack are held up by a plate. An automatic stop, working in conjunction with the transfer, positions the coupling in the chuck.

Cutting—After the chuck grips close on the part, it moves rearward from the loading position to the tapping area. Then it indexes 90 degrees to bring the coupling into the first tapping position.

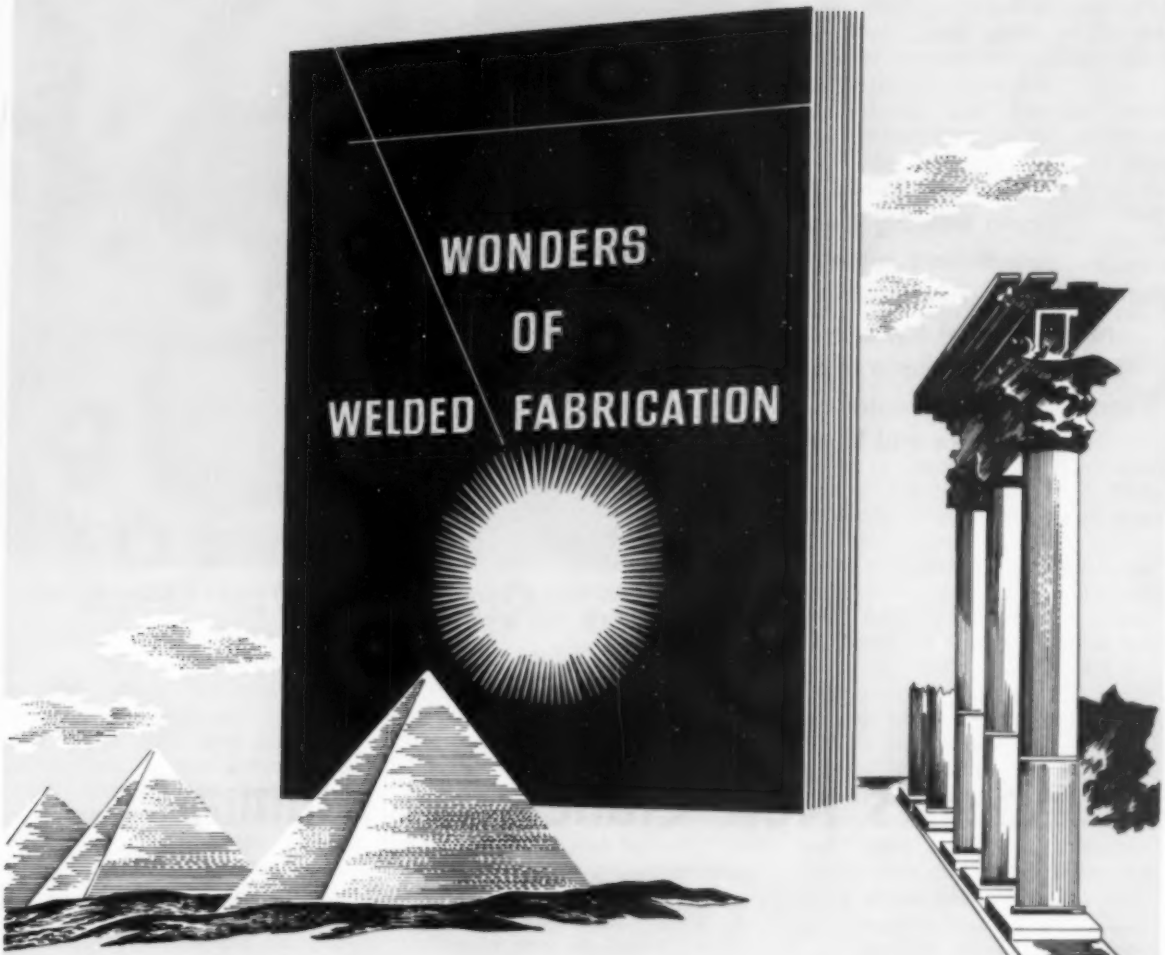
The spindle and tap head unit rapidly approach the part, then decelerate as the lead screw nuts engage to start the feed. The tap trip ring contacts the coupling face and coolant is turned on. Simultaneously, the head enters the workpiece to produce the thread set by the lead screw.

Reverse—As the tap collapses at the end of the thread, the lead screw nuts open, coolant flow stops and the spindle rapidly returns to its top position.

The chuck cylinder then indexes through two 90-degree cycles to bring the second end of the coupling in position for tapping, and the machining cycle repeats.

After the second end has been tapped, the chuck indexes 90 degrees and moves forward to the loading position. The grips open and the entire cycle repeats with the completed coupling pushed out of the chuck by the next part.

All necessary parts of the machine, including the magazine, transfer and chuck jaws can be altered to accommodate different-sized couplings.



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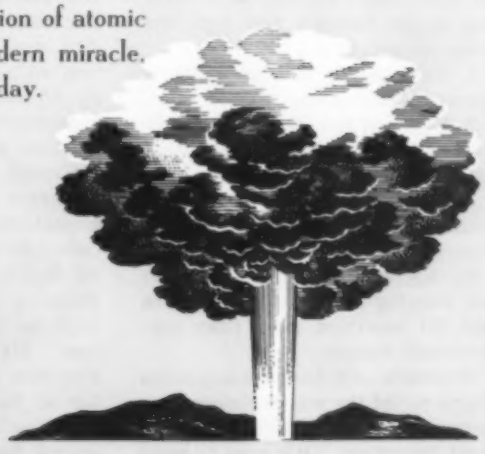
This new illustrated booklet shows why steel fabrication is replacing other types of construction wherever heavy metals are used . . . it tells how a leading fabricator applies the advantages of fabrication in many fields, from machine tool building to the generation of atomic power. This informative story of metal working's modern miracle, welded fabrication, is yours for the asking . . . write today.

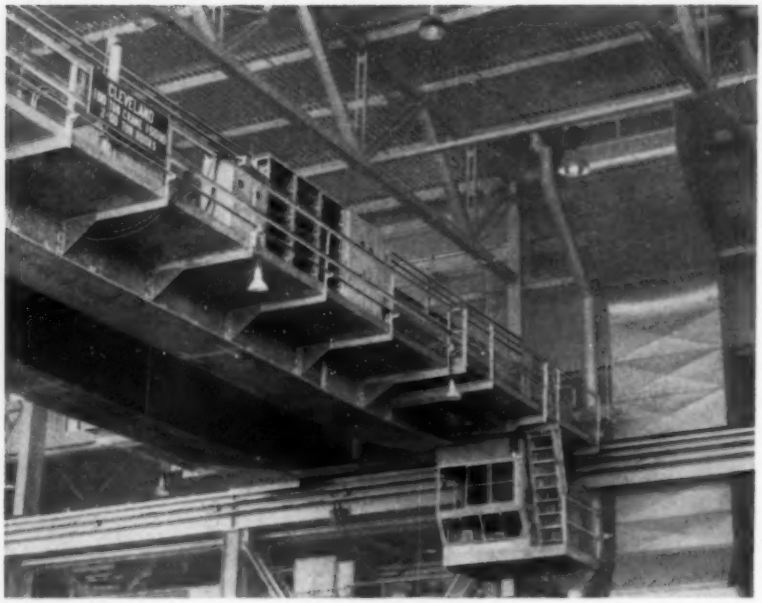


Acme WELDING

DIVISION of THE UNITED TOOL & DIE CO.

1030 NEW BRITAIN AVE., WEST HARTFORD 10, CONN.

A new alloy (5083), sigma welding and Heliarc cutting put aluminum cranes within reach of most factories. How they are made and some of their advantages are told here



The bridge of this 100-ton crane is 105 ft long. But there's a difference: Everything, including the cab, is aluminum

Kaiser's New Cranes Are Aluminum

THE new aluminum plate and foil rolling mill at Ravenswood, W. Va., is being equipped with 27 cranes made of welded aluminum.

Don G. LaRue, manager, west coast branch, product development, Kaiser Aluminum & Chemical Sales Inc., Oakland, Calif., says they're the nation's first and lists these advantages:

1. They weigh half as much as conventional cranes.

2. They put out 25 per cent more work due to faster acceleration and deceleration.

3. They require less support (craneways, columns, footings and excavation).

4. As replacements, they can use existing supporting structures and lift one-third more than conventional models.

Weldable—Of the developments which paved the way for aluminum cranes, Kaiser's 5083 alloy was the most important. It's easy to weld with any of the several inert gas systems. In the as-welded condition, it has an ultimate tensile strength of 41,000 psi; elongation in 2 in. is 18 per cent.

The Cleveland Crane & Engineering Co. designed, developed and fabricated the cranes in its Wickliffe, O., shop. The final design was proved out in co-operation with Kaiser engineers—a 50-ft, 10-ton, half-scale model was constructed and strain tested to confirm engineering calculations.

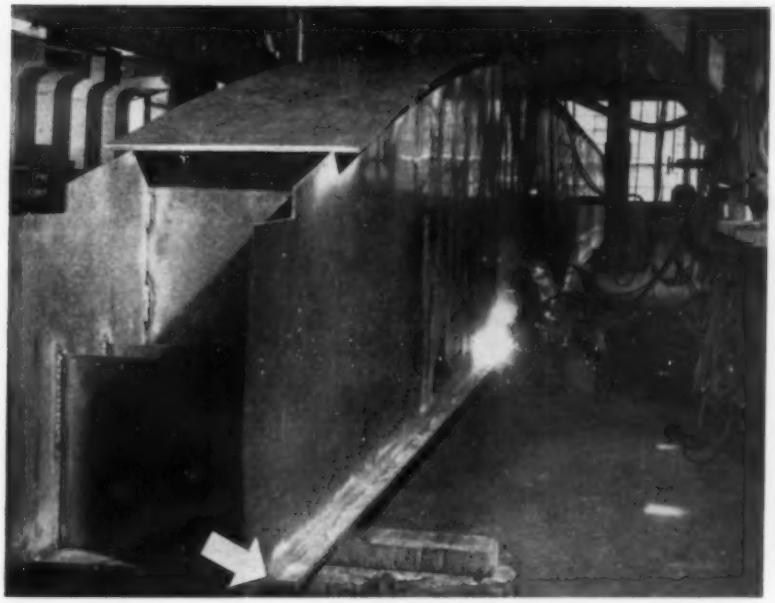
Exploit Benefits—Cost conscious designers will remember several advantages of a lightweight structure. Reduced wheel loads mean lighter building construction. Shipping cost savings can run as high as 2 per cent of the total cost. Handling time during construction also is cut. The contractor at Ravenswood says his construction time is about half that required for conventional types.

Kaiser won't paint the cranes even though they operate in a mill atmosphere.

Design—Cleveland Crane's designers needed no radical departures in making all-aluminum cranes. Their first concern was modulus of elasticity. The 1942 American Iron & Steel Institute specification allows steel girder deflections of 0.0015 in. per inch of span. A recent revision reduced that to 0.001 in. to limit design stresses. Since an aluminum girder can accommodate greater deflection with extremely low design stresses, the 0.0015-in. value was selected.

Depth of the girder was increased 25 per cent to obtain the desired deflection. That, plus an appropriate increase in gage, makes the aluminum girder about 60 per cent lighter than one of steel.

Components for the final as-



Cleveland Crane continuously welded the web to the top cover. Equipment is on gantry (right). Note the clean weld area, essential to a good joint

sembly include full and partial depth diaphragms and full-depth web plates with web and cover plate joints at third points of the span. Reinforcing butt straps behind web and cover plate splices reduce stress in the joint area and permit camber adjustment in assembly.

To evaluate buckling characteristics of the webs and to check calculated stresses, Cleveland Crane made strain gage tests on a half-scale model. Results corresponded satisfactorily with theoretical stress calculations.

Fabrication—Six welders qualified without difficulty on sigma welding equipment (Heliarc) which was used both manually and automatically in a gantry carriage. Argon was used with 5356 aluminum alloy filler wire. Weld test specimens were evaluated and approved by Kaiser engineers.

Operating speeds were considerably higher than those used for mild steel. Continuous welds (web to cover) were made at 20 ipm. Higher speeds more than offset the cost of argon gas.

Shearing and forming costs were about average for plates up to ½-in. thick. The cost of sawing aluminum plates up to 2 in. thick was slightly higher than torch cutting. (The newer methods, like Heliarc cutting, are much faster and will handle plates up to 1½-in. thick. Plates 1 in. thick can be cut at a speed of 50 ipm.)

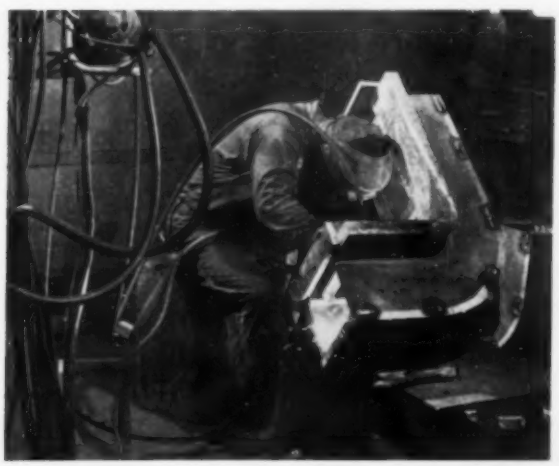
Here is the assembly sequence:

1. Tack weld diaphragms to top cover. 2. Tack weld first web to diaphragms. 3. Final weld top cover to diaphragms. 4. Tack weld second web to top cover. 5. Turn girder on sides and final weld webs to diaphragms. 6. Lay bottom cover with preset camber and tack weld to webs. 7. Simultaneously weld webs to top cover. 8. Simultaneously weld both webs to bottom cover. 9. Continuous weld web butt joints to fix camber.

There was little change in girder camber during welding. A preset camber of 1½-in. yielded a final camber of 1 in.

Skip welds join the top cover and webs to the diaphragms. Double-pass continuous welds join cover plates and webs.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.*



Some hand welding was used. Operator is joining a girder notch for the saddle assembly. Plate nearest him is 2 in. thick

Capacities and Spans of Kaiser Cranes

Quantity	Capacity (tons)	Span (ft)
2	125	83
2	100	105
2	80	61
4	50	105
1	40	61
2	30	61
1	20	105
1	15	105
3	15	83
7	10	105
2	5	60½

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(capacities 1,000 to 10,000 lbs.)

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P&H INDUSTRIAL DIVISION

aukee 46, Wisconsin

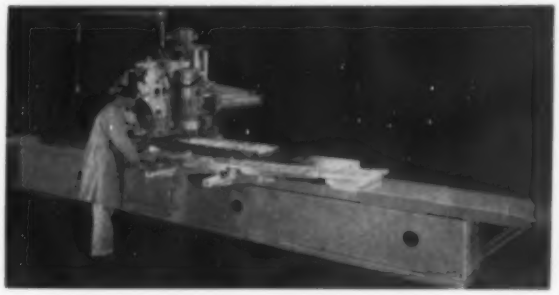
Spar Mill Speeds Machining of Airframe Parts

This hydraulic planer-type mill is for high precision machining of complex shapes.

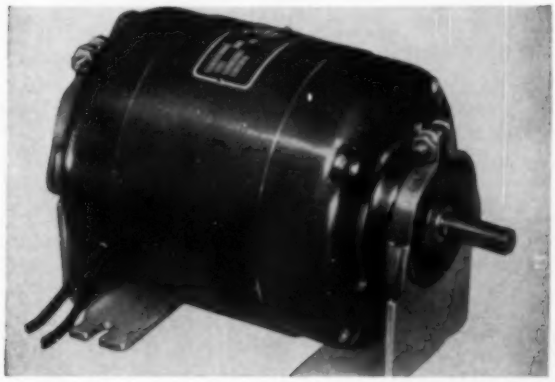
Machine heights of 30, 36 and 42 in. are available. Widths are 30 or 36 in. and stroke lengths are 6, 8 or 10 ft.

Bed and table ways are designed for tracer-milling control. They are square with hold-down for vertical adjustment and a narrow guide on the column side.

Hydraulic power is provided by a 7½-hp unit with two pumps. *Write*: Rockford Machine Tool Co., 2500 Kishwaukee St., Rockford, Ill. *Phone*: 3-7611



Induction Motor Is Used in Office Machines, Blowers and Pumps



This split-phase Type U motor has ratings of 1/20 and 1/15-hp at 1725 rpm and 1/30-hp at 1125 rpm.

The motor has resilient mounting, thermal overload protection, centrifugal cutout and comes in a gray mottled baked enamel finish.

Accurate bearing alignment and uniform air gap are provided by close tolerance machining. Operation is quiet and efficient.

The compact unit has been field tested for several years and is now being offered for general application.

Present packaging requires that the motors be sold in multiples of ten.

Single units are available for experimentation. *Write*: Bodine Electric Co., 2254 W. Ohio St., Chicago 12, Ill. *Phone*: Seeley 3-6410

Inert Gas Process Cuts Nonferrous Metals

Standard Aircomatic welding equipment, with simple adjustments in gas flow and steel wire speed, can be used for cutting nonferrous metals in addition to welding ferrous and nonferrous metals.

Both high production and manual equipment can be adjusted easily.

It cuts metals like aluminum, stainless steel, chrome steel, nickel, Monel, Inconel, copper, brass and aluminum bronze well enough for subsequent welding operations.

Cutting speeds on ¼-in. plate: 132 ipm on aluminum and 85 ipm on stainless steel.

Severance cuts can be made on titanium and magnesium.

The process uses a consumable wire electrode in an atmosphere of an inert gas, such as argon. The gas is introduced around the electrode to exclude atmospheric gases from the area around the electric arc and weld puddle. This prevents contamination by

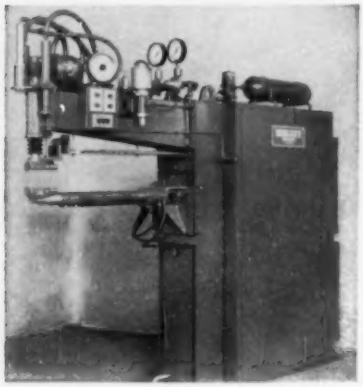
other gases. *Write*: Air Reduction Sales Co., division of Air Reduction Co. Inc., 150 E. 42nd St., New York 17, N. Y. *Phone*: Murray Hill 2-6700

NEW PRODUCTS and equipment

Resistance Welder

This press model machine seam and spot welds light gage metals.

Upper and lower heads can be rotated to either side to permit transverse or longitudinal seam welding.



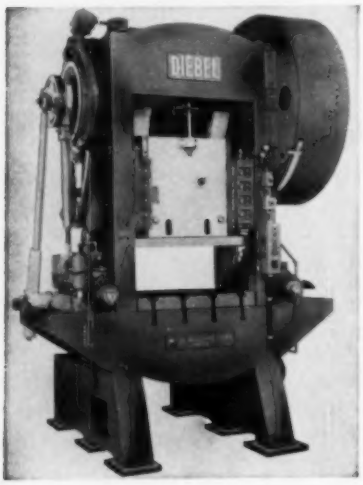
The pressure system can exert a maximum electrode force of 120 lb under an air line pressure of 80 psi. Minimum force is 38 lb.

The welding stroke is ¼-in., plus a 3½-in. retraction stroke. *Write*: Department M-13, Sciaky Bros. Inc., 4915 W. 67th St., Chicago, Ill. *Phone*: Portsmouth 7-5600

Automatic Press

Lamination, progressive blanking and forming and large blanking work are done by this 150-ton press.

Width of feed is 18 in. Length of feed, 0 to 13⅝-in. Standard equipment includes a recirculating lubrication system for main bearings and the slide, safety shut-off devices, special shock mounts and an air clutch and spring applied brake. *Write*: Department L, Di Machine Corp., 2711 W. Irving Park Rd., Chicago 18, Ill. *Phone*: Independence 3-3101



Welding Electrode

Airco 90B is a heavily coated electrode of moderate arc force that operates in all positions on alternating or direct current.

The general purpose electrode meets E-6013 specifications and welds mild steel to medium carbon and low alloy steel.

Mechanical and impact properties are high, while the finished bead is free of surface depressions. *Write*: Air Reduction Sales Co., division of Air Reduction Co. Inc., 150 E. 42nd St., New York 17, N. Y. *Phone*: Murray Hill 2-6700

Drum Sander

The Cone-Loc is an abrasive wheel 4 in. in diameter which is used with high speed grinders in buffing, grinding and polishing operations.

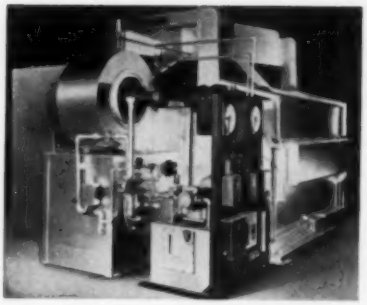
The split-drum sander can operate at 6000 rpm. It uses strips of coated abrasives. *Write*: American Diamond Saw Sales, 120 N.W. Ninth Ave., Portland 9, Oreg. *Phone*: Capital 7-6679

Flattening Furnace

This furnace flattens skins for aircraft wing sections while it is tempering or precipitation hardening them. Skins can be up to 74 x 100 in. and made of such materials as 17-7PH stainless.

The circulating type furnace can be heated with gas or electricity.

Two cast iron dies are inside the furnace. The bottom die is stationary and the top die is mounted to the hydraulic cylinder



with a ball joint. Doors at the front and back allow the furnace to be used at both ends.

Control will hold ±5 degrees from 250 to 1100°F. *Write*: Department 9, Waltz Furnace Co., Symmes St., Cincinnati, O. *Phone*: Capital 1-2444

Sintered Iron

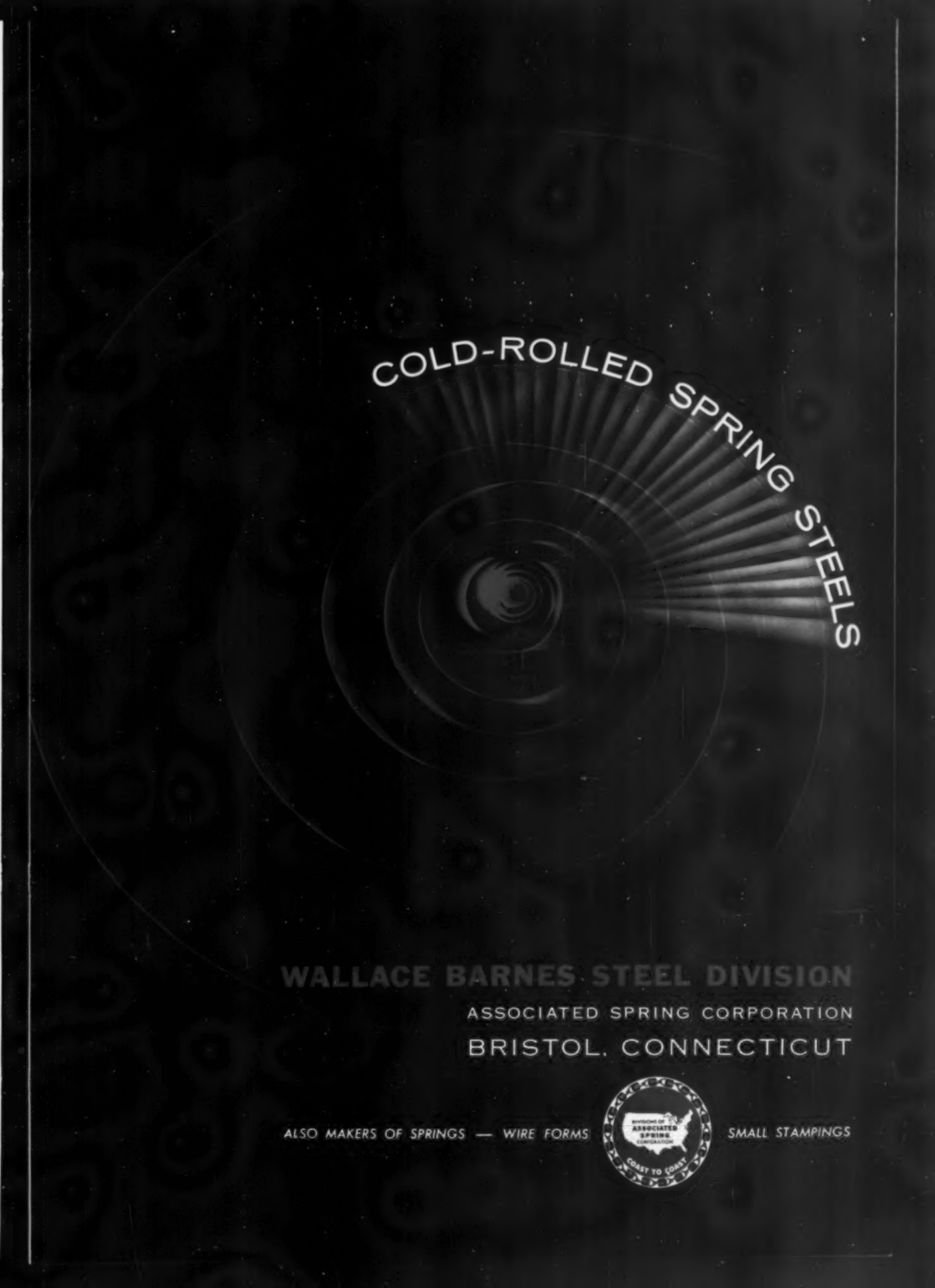
Powdiron FM is a pure material with good machining properties. It has high ductility, and tool life is said to be triple what it is with ordinary sintered iron. *Write*: Bound Brook Oil-Less Bearing Co., Bound Brook, N. J. *Phone*: Elliot 6-0441

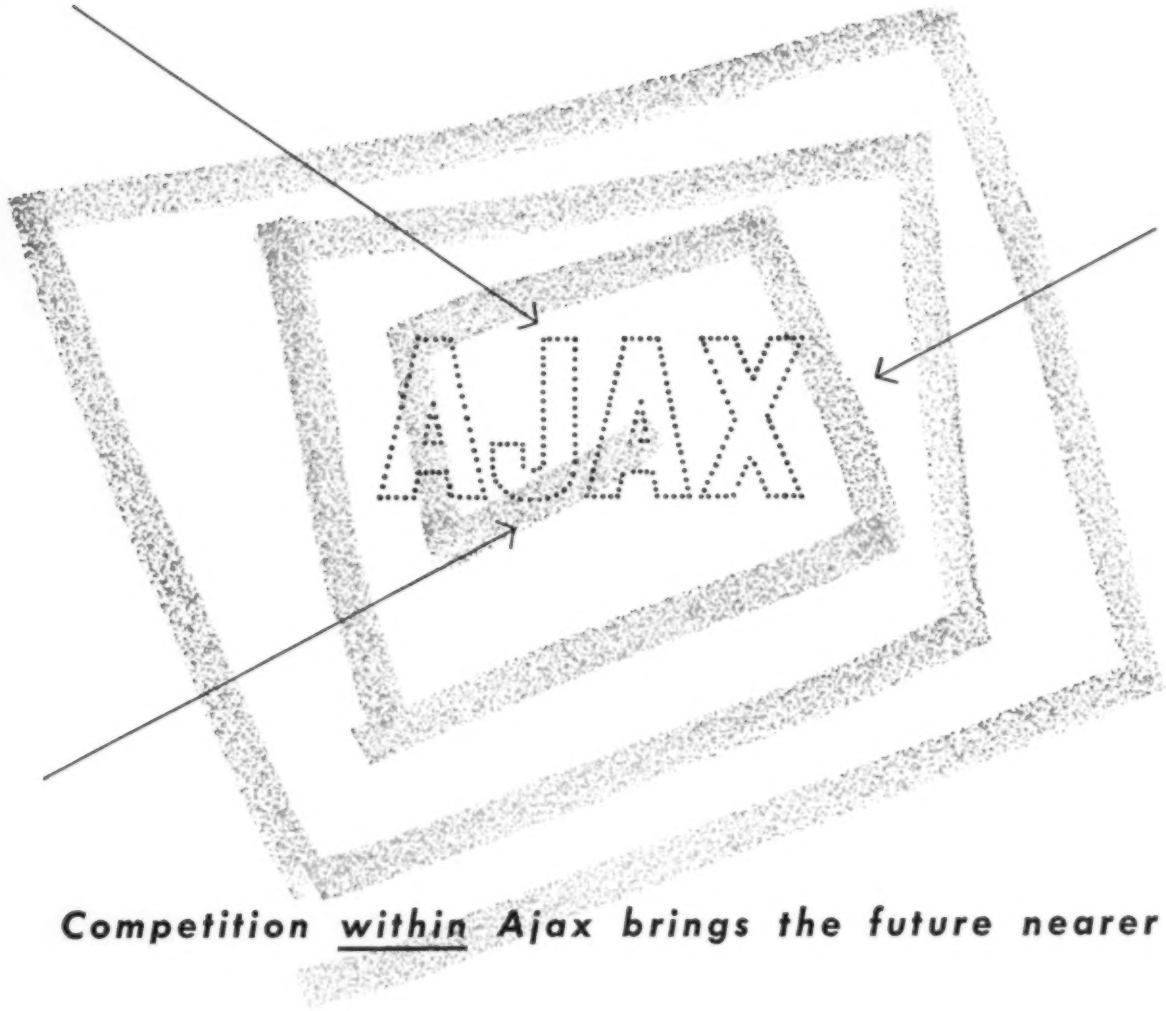
Gas Torch

Manufactured, mixed, natural, propane or butane gases are burned by this portable torch. It operates with compressed air at 40 psi or more pressure. The burner uses a venturi injector principle to mix the aspirating air with the gas to give high heating efficiency.

The torch lights instantly without preheating. It operates at 2700°F and is not affected by wind or weather.

The torch is made in five sizes. The smallest produces a flame from 6 to 18 in. long and a maxi-


COLD-ROLLED SPRING STEELS
WALLACE BARNES STEEL DIVISION
ASSOCIATED SPRING CORPORATION
BRISTOL, CONNECTICUT
ALSO MAKERS OF SPRINGS — WIRE FORMS
DIVISION OF ASSOCIATED SPRING CORPORATION
COAST TO COAST
SMALL STAMPINGS



Competition within Ajax brings the future nearer

Competition among the furnace manufacturers sharing the name "AJAX" is the best kind of competition. For it is strengthened by constant interchange of ideas and information which others classify "trade secret." That's why all Ajax furnaces share so many important advantages. And why the men who buy Ajax furnaces, operate Ajax furnaces, and depend on Ajax furnaces, regard them as the standard against which all others must be measured. This give-and-take among the independent Ajax associates is your assurance that the name Ajax will continue to mean, in the future as in the past, furnaces in the front rank of electric heating progress.

AJAX

ELECTRIC COMPANY
salt bath furnaces

ENGINEERING CORPORATION
low-frequency induction furnaces

ELECTROTHERMIC CORPORATION
high-frequency induction furnaces

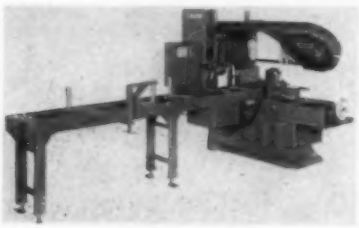
AJAX ELECTRIC CO.....980 Frankford Ave., Phila. 23, Pa.
AJAX ENGINEERING CORP.....Trenton 7, New Jersey
AJAX ELECTROTHERMIC CORP.....Trenton 5, New Jersey

mum heat release of 325,000 Btu (using 1000 Btu gas). The largest burner produces a flame 10 to 48 in. long, with a maximum heat release of 1.3 million Btu an hour. *Write*: Hauck Mfg. Co., 124-36 Tenth Ave., Brooklyn 15, N. Y. *Phone*: South 8-7309

Bar Feeder

This automatic feeder, the Roto-Veyor, was developed for use with the Model 1200 horizontal band saw.

The feeder has a capacity of 12¾-in. OD for rounds, 12 x 12 in. for rectangular shapes. It will project to within 7 in. of the end of stock.



Unlimited projection length is featured. Extension conveyor sections, available in 10-ft multiples, are powered by the basic unit feed drive. *Write*: Wells Mfg. Corp., 1515 Fillmore St., Three Rivers, Mich.

Lead Screw Tapper

This adjustable pitch tapper converts from one pitch to another quickly. Model AP 9100 converts from 11 pitch threads to 12, 13, 14, 16, 18, 24 and 28 pitch. Model AP 9000 converts from 24 pitch to 28, 32, 36, 40, 44, 48, 56, 64, 72 and 80 pitch.

A graduated scale which indicates pitch settings is attached to a lever which controls the vertical travel of the lead screw follower and tap.

Changing pitches demands only that the scale be adjusted by loosening, adjusting and tightening four socket screws. *Write*: Jarvis Corp., Middletown, Conn. *Phone*: Diamond 7-3321

Stainless Electrodes

A smooth arc with little or no spatter is provided by two series of coated electrodes.

Aerocor is for welding aircraft and light gage stainless steel. Fabricor is for welding stainless plate. Both are applied with direct current reverse polarity.

Once the arc is started, the operator can use the "drag-type" welding technique. The rods can be used for tacking because they can be restarted repeatedly without difficulty. *Write*: Arcos Corp., Philadelphia, Pa. *Phone*: Saratoga 7-1500

Metallizing

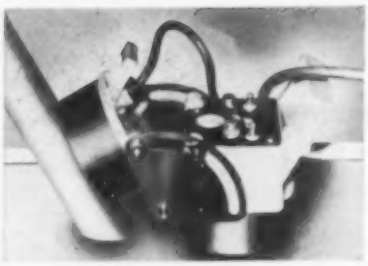
Colmonoy C-250 is a metal powder for rebuilding engine and compressor crankshafts. It is a high-chromium-nickel powder containing chromium borides.

When applied, the material has a low coefficient of friction, controlled surface porosity and good oil retention. These properties increase wear resistance and service life. *Write*: Wall Colmonoy Corp., 19345 John R St., Detroit 3, Mich. *Phone*: Twinbrook 3-3800

Welding Fixture

This magnetic fixture holds ferrous metals in position for welding at any angle without preliminary setup time.

The fixture positions instantly



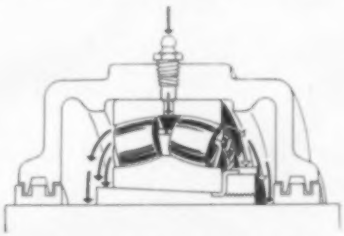
with absolute accuracy and releases immediately. Only one operator is needed for the portable unit.

Maximum capacity is over 1 ton. *Write*: Magnetic Tool Corp., 1955 Lafayette St., Santa Clara, Calif.

Bearing Lubrication

Type C spherical roller bearings of 140 mm (5.5118 in.) OD and larger have been improved by center lubrication.

This has been done by a groove which is machined around the circumference of the bearing's outer ring. Equally spaced holes drilled



in the ring channel the lubricant from the groove to the center of the bearing.

The lubricant (it's introduced through a fitting in the center of the housing cap) moves along the groove and through the holes directly to the center of the bearing where it does the most good.

Old lubricant (and any abrasive dust, dirt, moisture or other impurities) is flushed away because the flow path of the lubricant is from the center to the side of the bearing. *Write*: SKF Industries Inc., Front St. & Erie Ave., Philadelphia 32, Pa. *Phone*: Garfield 6-6400

Welding Control

This nonsynchronous resistance welding control panel combines the advantages of electronic control with those of hermetically sealed relays.

Relays provide long life, consist-

CF&I STEEL PRODUCTS . . . and

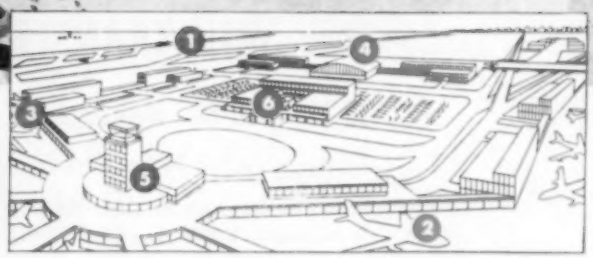
A few short years ago, visionaries were saying that "someday" airports would include hotels . . . and really efficient facilities for handling planes, passengers and the ground-bound vehicles which must serve both.

Yet "today" is now a reality in many American cities—thanks to skilled architects, designers, contractors and builders who combine ingenuity with practicality in designing airports, as well as schools, hospitals and many other types of buildings. It is this practicality that leads so many of them to specify CF&I Steel Products.

As each plane lands ❶, for instance, it's usually just a few inches away from a very important CF&I Product. For **Clinton Welded Wire Road Fabric** is used in the runway so that it can withstand the terrific shock of landing planes as well as the abuse of weather and time. What's more, CF&I Products helped build the runway. There were **CF&I Cutting Edges** on the giant bulldozers that carved out the runway site . . . **Wickwire Rope** on the draglines helped remove the surplus earth . . . and **CF&I Industrial Screens** were used to prepare the sand and gravel that went into the concrete.

In the plane itself ❷, **Wickwire Aircraft Control Cable** operates wing and tail surfaces of the plane—just as **Wickwire Springs** and **CF&I Industrial Wire Cloth** play important parts elsewhere in the plane.

After the passengers deplane to an area protected by **CF&I Realock Fence** ❸, the plane may be moved to a hanger ❹. There other CF&I Products come into play.



today's airport

Some of the mechanic's tools, for example, are made from special **CF&I-Wickwire Wire** . . . and **Wickwire Wire Rope Slings** serve many purposes.

The passenger terminal building ❺, is built of concrete—concrete that's reinforced with **CF&I's Clinton Welded Wire Building Fabric.**

This type of construction is also widely used in the airport hotel ❻. And you'll find another CF&I Product playing an indispensable part here, too. It's dependable **Wickwire Elevator Cable.**

Even if you don't build airports . . . or operate them . . . you can still use many of the long line of CF&I Products to excellent advantage right in your own operations. Contact your nearby CF&I Representative for complete details.

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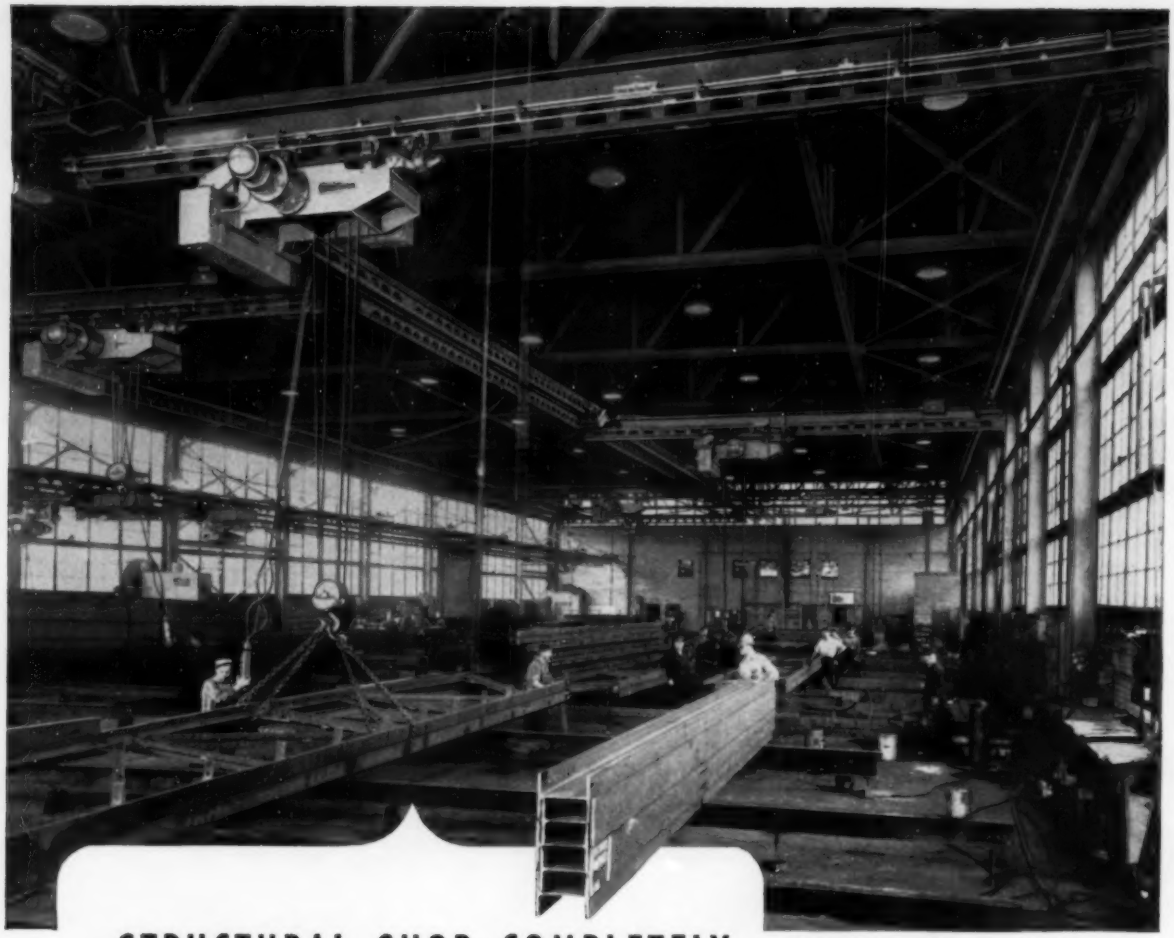


STRUCTURAL SHOP COMPLETELY COVERED WITH **TRANSFER CRANES**

... Eliminate Lost Time Waiting for Crane Service

... Enable Direct Fast Delivery Between Any Points in Shop

... Hoist Carriers Can Be Used Together or Separately in Accordance With Load Requirements

In this area are six motor driven 5 ton, 38′ 0″ span transfer cranes on two runways. Any crane on one runway may be interlocked with any crane on the other runway, permitting a hoist carrier to transfer from one to the other. Not only does this permit direct delivery of loads between any two points in the shop, it allows two hoist carriers on one crane to support both ends of a long truss when desired.

Along the wall at left three two ton, 12′ 0″ span hand propelled cranes with electric hoists handle beams in and out of a punching machine and spacing table.

A BIG factor in the rapid growth of Standard Iron & Steel Works, Limited, Toronto, Canada, is acknowledged to be their wide use of Cleveland Tramrail transfer cranes. This equipment makes possible a highly efficient operation, greatly speeds production and cuts costs.

Cleveland Tramrail equipment has been used at Standard Iron from their early days in the fabricating business. As the company has expanded, more Tramrail has been added. Today Standard Iron is one of the foremost companies in the Toronto area in the design, fabrication and erection of structural steel for buildings and bridges.

For live, aggressive companies like Standard Iron & Steel Works, Limited, Cleveland Tramrail has much to offer. It provides real help in the struggle with rapidly rising production costs. A nearby sales engineer will gladly give you details.

CLEVELAND TRAMRAIL

Overhead Materials Handling Equipment

CLEVELAND TRAMRAIL DIVISION • THE CLEVELAND CRANE & ENGINEERING CO. • 7817 E. 290th ST. • WICKLIFFE, OHIO

NEW PRODUCTS and equipment

ency and improved performance in welding control; the electronic timer eliminates the adverse effects of voltage fluctuations.

The building block technique makes it possible to provide custom-made panels for any nonsynchronous application. *Write*: Specialty Control Department, General Electric Co., Waynesboro, Va.

Angular Drilling Machine

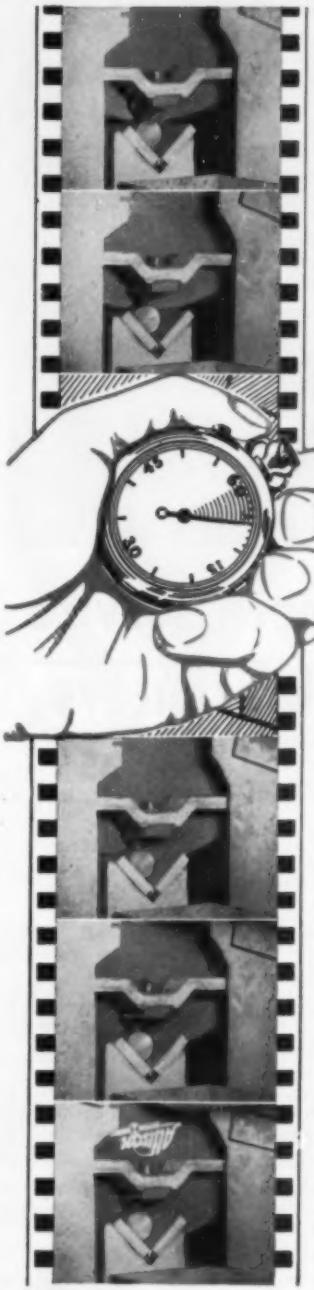
Up to 135 gas burners can be drilled in an hour with this radial drill. It makes 34 holes at a time. They're ⅛-in. in diameter and at

an angle of 45 degrees. It takes two passes to drill the 68-hole circular pattern.

The drill head is fed automatically. *Write*: Zagar Inc., 24000 Lakeland Blvd., Cleveland 23, O. *Phone*: Redwood 1-0500

Abrasive Cutting | *the best way to cut many materials the only way to cut some*

Allison Cut-Off Wheels



Cut 1¼" Bar Stock in 6 seconds

Abrasive wheel cutting is faster than sawing. In many cases it is ten to twenty times as fast.

An abrasive wheel will cut the hardest materials with ease. No need to anneal or otherwise prepare material for cutting.

A properly selected abrasive wheel leaves a finish which requires little, if any, "cleaning-up" operation.

At the left an ALLISON Abrasive Cutting Wheel is shown cutting 1¼" bar stock in 6 seconds per cut.

HOW'S THIS FOR PERFORMANCE?

	Cutting Time
WET CUTTING	
Steel Bar.....8" dia... Rotary-type machine.....	320 seconds
Chrome Steel Bar.....4" dia... Oscillating-type machine..	105 seconds
DRY CUTTING	
Cold-rolled Steel Bar..1" dia... Chop Stroke-type machine..	2 seconds
Angle Iron.....1" x 1" x ⅛"... Chop Stroke-type machine..	2 seconds

Allison ABRASIVE CUTTING WHEELS

It pays to consult a specialist

Profitable abrasive cutting means using the right abrasive wheel...and the proper abrasive cut-off machine...for the specific job. Why not let an ALLISON abrasive cutting specialist check your hardest cutting job?

Send for Booklet "ABRASIVE CUTTING" today

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ALLISON DIVISION
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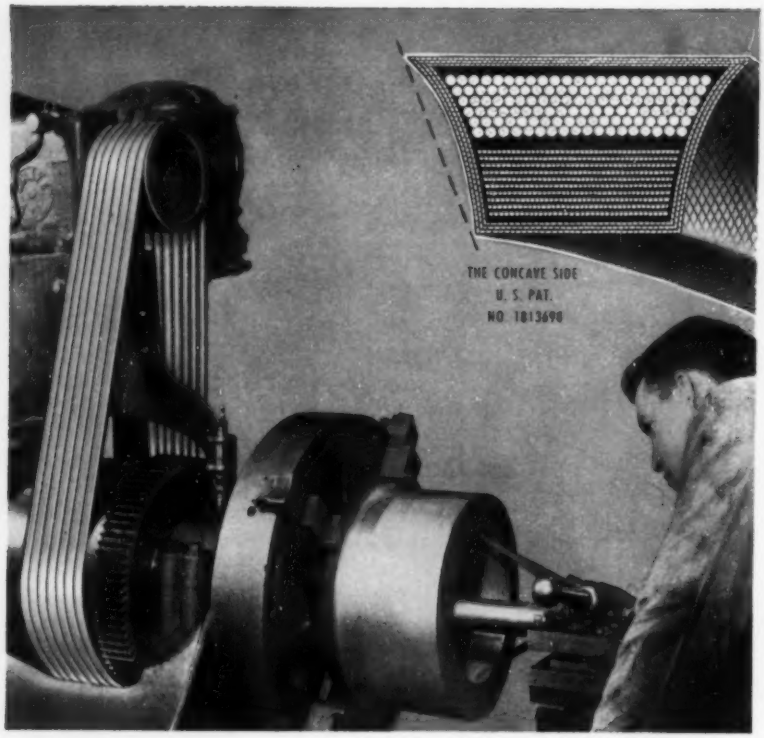

WHY you get more service from V-Belts with concave sides

Each sidewall of a Gates V-belt is concave (Fig. 1) — a precisely engineered curve that makes V-belts last far longer.

HERE'S WHY: on the bend around the sheave, the concave sides of a Gates V-belt fill out and become straight (Fig. 1-A). Thus the belt makes full contact with the sides of the sheave, grips the sheave *evenly*.

This even contact distributes wear uniformly across the sides of the belt. Uniform wear lengthens belt life; keeps costs down.

MAKE THIS SIMPLE TEST

Bend a straight-sided belt (Fig. 2). The sides bulge at the bend causing uneven contact in the sheave groove (Fig. 2-A). Naturally, wear is greater at points indicated by arrows. Result: shorter belt life, increased belt costs.

To cut down-time and V-belt replacement costs, specify belts that grip evenly and wear longer. Specify Gates Vulco Rope — the V-belt with concave sides. The Gates Rubber Co., Denver, Colorado — *World's Largest Maker of V-Belts.*

There are Gates Engineering Offices and Distributor Stocks in all industrial centers of the United States and Canada, and in 70 other countries throughout the world.

Gates

TPA 10PA

Gates VULCO ROPE Drives

NEW literature

Write directly to the company for a copy

Thermostats

Bulletin 5000, 2 pages, describes hermetically sealed and semi-inclosed thermostats. Stevens Mfg. Co. Inc., Mansfield, O.

Sprag Clutch

Bulletin 104-C, 26 pages, describes sprag clutches for overrunning, indexing and backstopping. Formsprag Co., 23601 Hoover Rd., Van Dyke, Mich.

Testing Machines

A line of universal testing machines with capacities of 500 to 1 million lb is presented in bulletin 54, 40 pages. Department 5754, Tinius Olsen Testing Machine Co., Easton Rd., Willow Grove, Pa.

Production Furnaces

This 4-page bulletin describes field-erected furnaces for metal heat treating, continuous enameling and aluminum melting. Lindberg Industrial Corp., 2321 W. Hubbard St., Chicago 12, Ill.

Pyrometer

A portable indicator which can be used to measure temperature directly when connected to a thermocouple and as a standard comparison instrument for checking potentiometer-type instruments is described in bulletin 64, 4 pages. Thermo Electric Co. Inc., Saddle Brook, N. J.

Fractional Gearmotors

This 12-page bulletin describes shaded pole gearmotors (torques up to 1/30-hp) and counters. Electro Counter & Motor Co., 1713 N. Ashland Ave., Chicago 22, Ill.

Silicone Lubricants

Properties and performance of silicone oils, greases and compounds are discussed in bulletin 6-101, 8 pages. Dow Corning Corp., Midland, Mich.

High Alloy Castings

This chart gives the standard designations and chemical composition ranges of heat and corrosion resistant cast alloys. Alloy Casting Institute, Mineola, N. Y.

Metallic Paint

Bulletin 388, 4 pages, describes metallized primers for use on aluminum, magnesium, electrozinc and hot dip galvanized metal. Nielco Laboratories, P.O. Box 4703, Detroit 19, Mich.

Shenandoah Valley VIRGINIA

Where the world's first reaper began harvesting new manpower for your new plant

On the McCormick farm, in Virginia's Shenandoah Valley, 22-year-old Cyrus built the world's first reaper. That was in 1831. Today, the farm revolution he started still frees a yearly harvest of new manpower from this Valley's increasingly mechanized farms.

A farm-grown working force is just one competitive advantage your plant will find in this sheltered Valley of Virginia. Here you are central to both northern and southern markets. You have top rail and highway transportation . . . with favorable freight rates to the Mid-West. You get coal,

chemicals, wood, other materials at short-haul savings.

Follow the leaders! American Safety Razor, General Electric, Reynolds Metals and Westinghouse are among the newcomers to Virginia's strategic valley. Your plant, too, can profit from the favorable taxes, mild climate, pleasant living and community co-operation that drew them here.

Ample, low-cost power flows from VEPCO's modern network. Generating capability, already 1,362,000 kilowatts, is due to reach 2,000,000 kilowatts by 1959.

For confidential information on local conditions . . . and site-finding service that keeps your identity a secret . . . write or telephone VEPCO, serving "The Top of the South."

SEE SIGHTS AND SITES! Visit Jamestown Festival, April 1-Nov. 30, 1957. And while here, see some of Virginia's plant sites.

VIRGINIA ELECTRIC and POWER COMPANY

Clark P. Spellman, Director—Area Development

Electric Building, Richmond 9, Virginia • Phone: 86-1411

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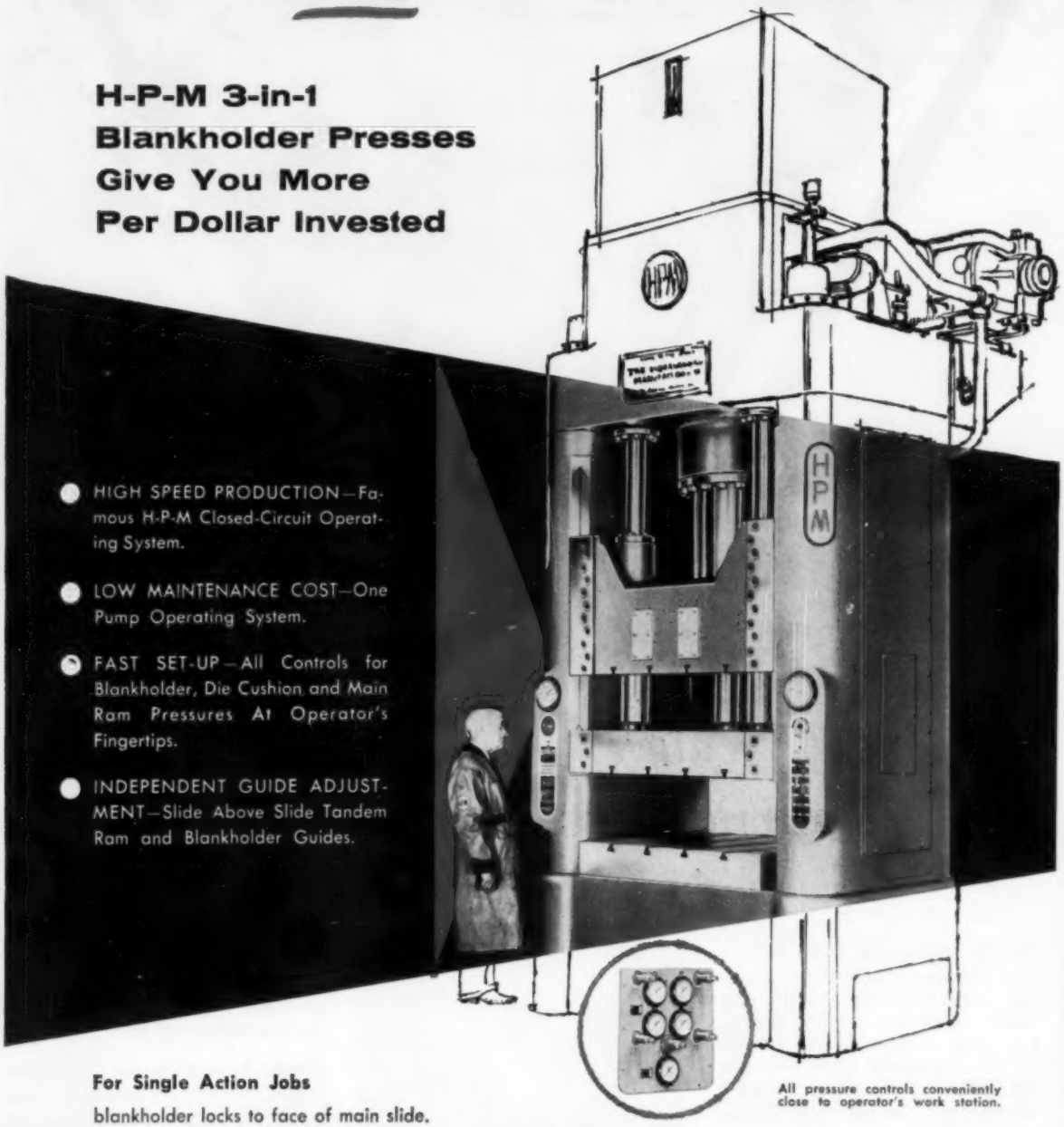
H-P-M 3-in-1 Blankholder Presses Give You More Per Dollar Invested



- HIGH SPEED PRODUCTION—Famous H-P-M Closed-Circuit Operating System.
- LOW MAINTENANCE COST—One Pump Operating System.
- FAST SET-UP—All Controls for Blankholder, Die Cushion and Main Ram Pressures At Operator's Fingertips.
- INDEPENDENT GUIDE ADJUSTMENT—Slide Above Slide Tandem Ram and Blankholder Guides.

All pressure controls conveniently close to operator's work station.

For Single Action Jobs

blankholder locks to face of main slide. Only main ram operates. Die cushion is idle.

For Deep Drawing Jobs

blankholder is locked to face of main slide. Main ram and die cushion operate. Die cushion used as lift-out with delayed action on return stroke.

For Deep Drawing Jobs

main ram, blankholder and die cushion operating. The latter serves as lift-out with delayed action on return stroke.

And, With H-P-M

pressure resistance of each blankholder ram can be individually adjusted—invaluable when drawing parts of irregular contours where blank must be held more firmly at certain points than others.

For complete information, write for Bulletin 5600.

HPM

THE HYDRAULIC PRESS MFG. CO.

Mount Gilead, Ohio, U.S.A.

A DIVISION OF KOEHRING COMPANY

Market Outlook

MILL PRICES of steel have risen 1.5 per cent since they started up again a month ago. And the current upward movement has not run its course.

On top of the increase in mill prices is a 7 per cent boost in rail rates for freighting steel to the user.

COMPARISON—The current rise of 1.5 per cent in steel prices was preceded by a 6.6 per cent advance in August, a sequel to a wage increase given to the steelworkers.

Most of the steel price increases in the last month have been in price extras rather than in base prices. This is demonstrated by the finished steel price index compiled by the U.S. Bureau of Labor Statistics (see page 113). This index covers base prices and representative price extras. At the beginning of the latest round of increases, the index stood at 168.8 per cent of the 1947-1949 average. Now it is 171.3, a 1.5 per cent increase. Meanwhile, STEEL's finished steel price composite, which measures base prices, rose from $137.66 a net ton to $137.98, an increase only about two-tenths of 1 per cent.

WAREHOUSES NEXT—Steel price increases have thus far in the latest round affected only the people who buy steel from the mills. Imminent are price increases at warehouses, suppliers of steel to a vast number of metalworking plants. The warehouses will have to pass on the increases that are being passed on to them by the mills.

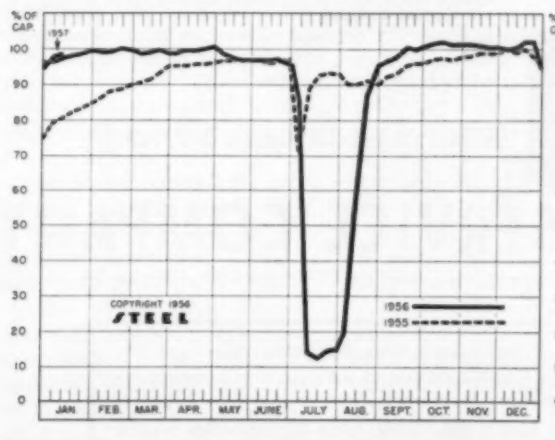
MARKED UP—Most recent price increases affect hot-rolled strip, plates, structurals, galvanized and galvannealed flat-rolled products, spiegeleisen, ferromanganese and foundry coke. Spiegeleisen went up $3 a gross ton, ferromanganese $20 a net ton and foundry coke $1 to $1.25 a net ton.

In contrast to the upward price trends is a decline in prices mills have to pay for one of their raw materials—scrap. This decline pushed down STEEL's price composite on steelmaking scrap to $60.83 a gross ton, a $2.34 reduction from the preceding week.

BUSY—Mills are busy turning out steel to fill orders. In the week ended Jan. 13, they produced steel for ingots and castings at 98.5 per cent of the Jan. 1, 1957, capacity (the largest capacity we've ever had). In the week ended Jan. 6, the rate was 98 per cent. At 98.5 per cent of capacity, the yield is 2,521,097 net tons. On last year's capacity, this yield would have represented an operating rate of 102.5 per cent.

CONTRASTS—Demand for steel is mixed. Some products are in heavy demand while others are moving slowly. Call for plates is so strong that hot-rolled sheet lines are being used to make light plates. Space is available on the hot-rolled sheet lines because of the reduced demand for cold-rolled sheets. (The raw material for cold-rolled sheets comes from the hot-rolled lines.) The sag in demand for cold-rolled sheets stems mainly from the decline in the automobile business. Appliance makers, too, have slowed down in their needs for cold-rolled sheets. In a few cases, warehouses have deferred or canceled orders they had placed with mills for cold-rolled and galvanized sheets.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

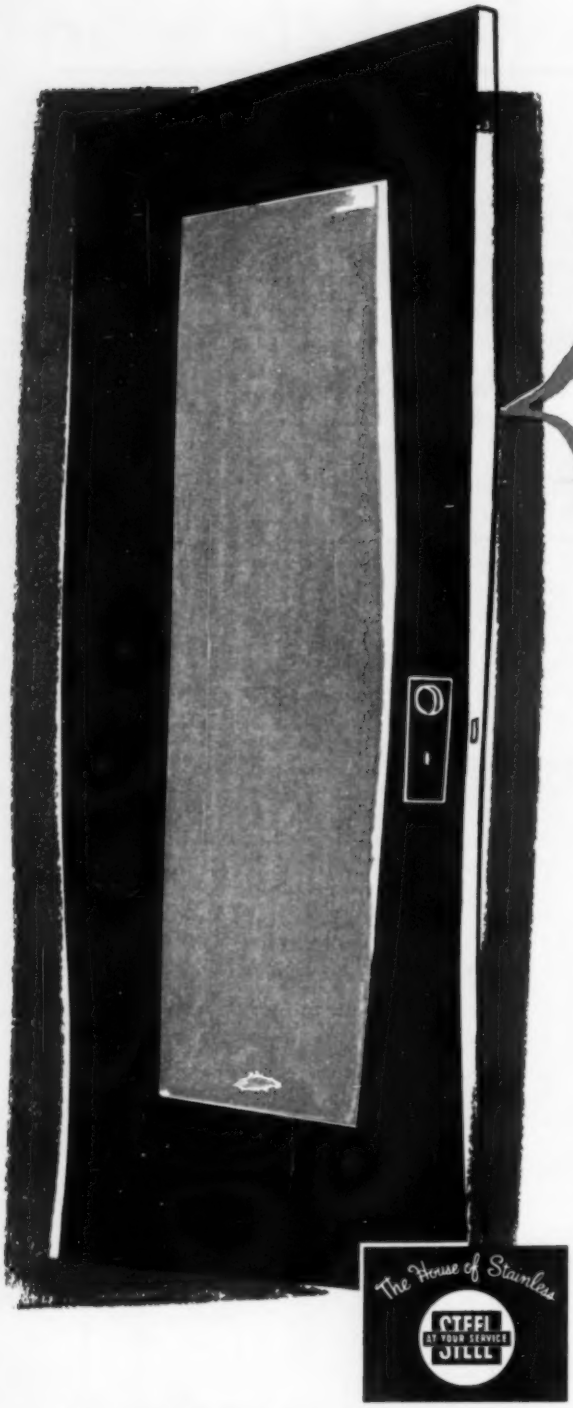
(Percentage of Capacity Engaged)

	Week Ended Jan. 13	Change	Same Week 1956	Same Week 1955
Pittsburgh	100.5	+ 0.5	102	80
Chicago	96.5	— 3.5*	98.5	84
Mid-Atlantic	102	0	97	76
Youngstown	102	— 2	98	86
Wheeling	98.5	— 0.5*	97.5	94.5
Cleveland	95	+ 2*	96	96
Buffalo	107.5	0	105	100
Birmingham	94.5	0	95.5	74
New England	73	+ 1	94	75
Cincinnati	90.5	+ 5	86.5	83.5
St. Louis	95.5	+11.5*	99.5	78
Detroit	101.5	— 1.5	105	88
Western	102	— 1	103	76
National Rate	98.5	+ 0.5*	98	82

INGOT PRODUCTION‡

	Week Ended Jan. 13	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	156.7†	155.0	157.0	151.1
NET TONS (In thousands)	2,517†	2,490	2,522	2,428

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,559,490 in 1957; 2,461,893 in 1956; 2,413,278 in 1955.



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It can mean help in selecting the type of stainless best suited to your particular needs. However, in actual practice, CSS service often goes far beyond the specific recommendation of material.

Because this metallurgical service is manned by trained personnel with practical shop experience, you can expect assistance in almost any way you need it. The following production helps are typical:

- **Exploring possible avenues for greater economies.**
- **How best to work with the material selected.**
- **How to adapt present equipment to handle it.**
- **Help in tool design.**
- **Recommendations on drawing compounds and lubricants.**
- **Counsel on set-up and operating procedures.**

In short, this service can be as broad and inclusive as your needs demand. And it's available to you at any time . . . without charge.

The House of Stainless welcomes the opportunity to extend this assistance and then back it up with prompt deliveries from warehouse stocks or direct mill shipments through our mill placement department.

Just phone LAfayette 3-7210

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Milwaukee District Office: 757 N. Broadway, Milwaukee 2, Wisc. Telephone BRoadway 3-7874

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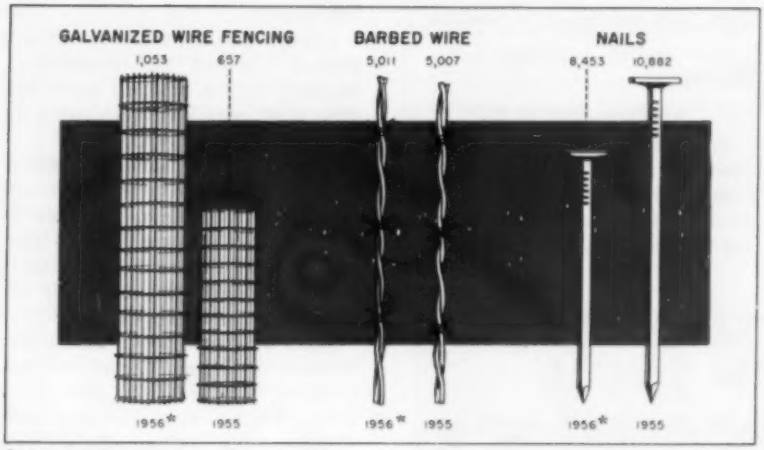
YOUR DEPENDABLE SOURCE FOR BOTH CARBON AND STAINLESS STEEL

A Look at Wire Imports

(Monthly average imports in net tons)



* First eight months.
Source: U.S. Bureau of the Census.

U.S. Wiremakers Squeezed

IMPORTS of wire and wire products are hurting U.S. producers.

The hurt is so severe that a substantial portion of our domestic wire mills is idle.

Particularly affected are producers along our East and Gulf coasts, because most of the imports are coming from European countries, notably Belgium. One southeastern U.S. mill which has eight wire fence machines was operating only three of them on an 8-hour shift and planned to cut operations even further. Its mill warehouse space was bulging not only with woven wire fencing but also with barbed wire and nails—and output of the last two products was due to be pared.

Another southeastern wire mill was running only four days a week, and a third company was averaging even less than that.

Broad Problem—Part of the ills with woven wire fencing, barbed wire and nails (known as merchant products) might be attributed to the farmers' economic problems and to the slowdown in construction of houses. But the problem isn't limited to the merchant products. It extends also to manufacturers wire. For instance, Belgium is shipping box binding and stapling wire (for making wooden crates) into the U.S. at $25 to $38 a ton less than the domestic price.

Foiled — One U.S. producer thought it might fend off some of the foreign competition by offering something special. He figured that cratemakers could increase their production if they had 700-lb coils of box binding and stapling wire instead of 70-lb coils — they wouldn't have to shut their machines down as often to refill them with wire. The ingenious producer also put the wire on a handy pallet. But it wasn't long before Belgium was shipping 700-lb coils on pallets into the U.S.

Quality of foreign wire is high in most instances, domestic producers sorrowfully admit.

Big Enough—While imports of wire and wire products are, in most instances, small compared with our domestic production, they are large enough to hurt when over-all demand is hardly enough to absorb our domestic output. In some instances, imports were at a higher monthly rate in 1956 than in 1955.

Imports of galvanized wire fencing in the first eight months of 1956 totaled 8421 net tons valued at $1,138,830, compared with a domestic output of 208,838 net tons. Of the imports, Belgium supplied 4927 tons valued at $656,431.

Imports of wire nails in the first eight months of 1956 totaled 67,628 net tons valued at $9,786,730. Domestic production of wire nails and staples in the first eight months totaled 385,828 net tons.

Strong Competitor — Imports snagged a big share of the barbed wire market. In the first eight months of 1956, they totaled 40,092 net tons valued at $5,428,791, compared with domestic production of 60,495 net tons of barbed and twisted wire. In 1955, barbed wire imports were equal to 53 per cent of our domestic output of that product.

Opportunists — Domestic producers point out that foreign mills sell above U.S. prices when domestic products are in strong demand and undercut when demand lightens. This can be seen in STEEL's price table on imported steel (page 121). Base price on imported bright common wire nails, for instance, is $158 a ton, compared with the lowest domestic price of $164. Imported barbed wire is quoted at $160 a ton, compared with a domestic price of $190.

Hard-to-get products like plates and structurals carry high prices on the import market. Imported plates are quoted at $190 a ton, in contrast with the domestic price of only $97. Imported structurals are $155 a ton, compared with a $100 domestic price.

Skimming the Cream—Another complaint of domestic producers is that foreign mills go after the market for the common, easy-to-make products, leaving the harder-to-make and specialty products business for the Americans. This unbalances operations — making some machines idle. There either isn't enough of the specialty business or the mills haven't enough specialty capacity to make up for the loss of the common products. One mill is paying overtime for the production of some

specialty nails, yet it can't sell all of the common nails it can produce.

Hopeless — Domestic producers of wire and wire products hold little hope of help from the government. The U.S. has been helping foreign countries build their industries to strengthen their economies and is not inclined toward protective tariffs.

One Consolation — Fortunately for the U.S. steel producers, demand for all forms of steel is not light. If it were, the impact of imports would be much more disastrous. Today, if the domestic mills can't sell their steel in one form they can sell it in another.

Wire . . .

Wire Prices, Pages 117 & 118

While demand for merchant wire products should be showing some seasonal improvement, there is little evidence of it to date. The lag in ordering by distributors may be due in part to the belief supplies are so easy buyers will have little trouble placing orders even if they delay placements until the last minute.

Except for heavier low carbon grades required for reinforcing, highway fabric, building mesh and pipe core, wire mill backlogs generally are not heavy.

Manufacturers wire volume is improving gradually for February and March shipment. Volume in both months will top that of January. Eastern and Midwest mills report some improvement in orders on automotive account.

Steel wire rope prices at the distributor level are erratic. A substantial tonnage for the Navy brought out a wide spread in quotations from 14 suppliers, bids ranging from 10.90 cents to 20.40 cents.

Stainless Steel . . .

Stainless Steel Prices, Page 119

Jessop Steel Co., Washington, Pa., increased its base prices of non-magnetic steels Jan. 3 to reflect increased cost of nickel and other raw materials. Grade No. 200, 7.75 per cent nickel, was increased by 2.25 cents per pound, and grade No. 9, 3.25 per cent nickel and 4.15 per cent chrome, was increased 1 cent a pound.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 116 & 117

Delivered prices on hot and cold-rolled sheets, and hot-rolled strip in both carbon and low-alloy high-strength strip are up $1 to $4 per ton as result of recent upward revisions in certain extras.

The changes were first initiated early in December on hot and cold-rolled sheets involving extras for size, cutting, cut lengths, specifications and chemical requirements, ranging from 5 to 20 cents per 100 pounds as a general thing. Newly printed extra lists are being issued by the various producers.

Strip Raised—U.S. Steel Corp. and its general operating divisions, Columbia-Geneva Steel Division and Tennessee Coal & Iron Division, increased certain extras on hot-rolled carbon and low-alloy high-strength steel strip, effective Dec. 28. The changes include increases of 5 cents to 20 cents per 100

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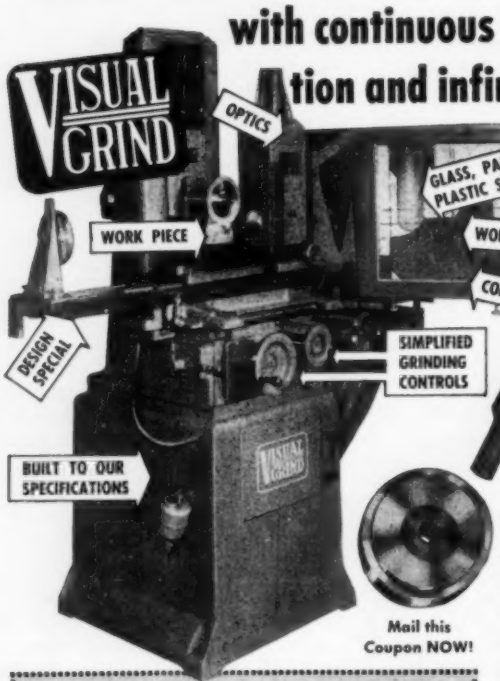

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pounds in gage and width extras, and in certain quality and chemical extras. The extra for carbon over 0.25 per cent to 0.40 per cent now also includes special soundness quality.

Other producers followed this action. Youngstown Sheet & Tube Co. made its changes effective Jan. 1. Together with certain other minor revisions, the over-all effect of the changes in strip extras is estimated to be an increase of less than 1 per cent. Alan Wood Steel's revision was effective as of Jan. 7. Republic Steel had the matter under consideration though it hadn't formally acted up to late last week.

Effective Jan. 4, a revised extra card on galvanized coils, flat sheets, formed roofing, siding and accessories, corrugated culvert sheets and galvannealed sheets, was issued by Republic. The new card, which supersedes one dated Dec. 11, 1956, incorporates a number of changes in dimensional and coating extras.

Demand Disappointing — For the most part, sheet demand continues disappointing, principally for cold-rolled. Automotive requirements are still lagging though they are better than they were a while back. Household appliance manufacturers are not taking as much tonnage as had been expected.

At the warehouse level, demand for cold-rolled and galvanized sheets is described as poor, with some producers reporting deferments, and, in some instances, cancellations. There is not even the jobber pressure for cold-rolled sheets that there was a month or so ago.

Most sheet sellers, however, look for an upturn as the quarter gets along, and the probability is that the mills will have a carryover into the second quarter, not only in hot-rolled sheets, which are the most active grade, but in cold sheets as well.

Expect Seasonal Rise—The mills anticipate a seasonal rise in demand for galvanized sheets, but they see no particular supply stringency ahead. Specialties are in moderate demand, and, except for high silicon sheets, no shortage is indicated.

In the Chicago area, cold-rolled sheets are not under heavy pressure though auto assemblies have been steadily improving.

Alloy Steel . . .

Base prices on high-temperature steels and high-nickel steels were increased by Crucible Steel Co. of America, New York, effective Jan. 7. The increases reflect higher costs of nickel and other raw materials, and range from ½ cent a pound to 12½ cents a pound.

Revised classification of extras booklets on hot-rolled alloy and special steels, blooms, billets, slabs, bars and spring sizes, are being distributed to customers by Republic Steel Corp.

The revised list went into effect Dec. 21, changes largely applying to grade extras, reflecting higher raw material costs, notably nickel.

The largest tonnage of alloy steel ingots ever produced by the Steel & Tube Division, Timken Roller Bearing Co., Canton, O., for a 12-month period was reported for 1956 by John E. Fick, vice

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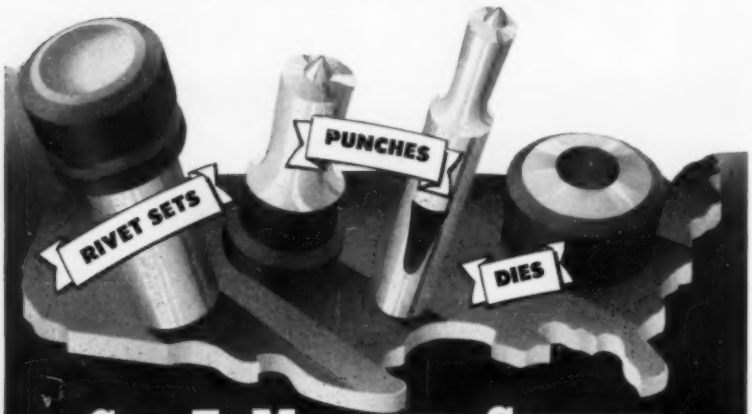

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president in charge of the division. Output was 662,000 tons compared with 637,197 in 1955.

Semifinished Steel . . .

Semifinished Prices, Page 115

The new open-hearth furnace at the Harrisburg, Pa., plant of Phoenix Iron & Steel Co., recently activated, expands ingot capacity of this works to approximately 500,000 tons annually.

A 45-man crew of No. 4 blooming mill at the Lorain Works, National Tube Division, U.S. Steel Corp., set a new record for production of semifinished blooms on Dec. 31. The crew piled up a new mark of 2800 tons of bloomed product rolled in a single 8-hour shift.

Steel Bars . . .

Bar Prices, Page 115

Revision in the quantity extra card on cold-finished carbon steel bars and shafting was announced by Jones & Laughlin Steel Corp., Pittsburgh, effective Dec. 31. The change eliminates the separate extras listing for flats which are now included with all other sections.

Also, it results in reductions in the extra on flats of 15 cents per 100 pounds in the 4000 to 5999 pound bracket; 30 cents on 6000 to 9999 pounds; 5 cents on 10,000 to 19,999 pounds; 5 cents on 20,000 to 39,000 pounds.

Cold-finished Still Lags — Demand for cold-drawn bars appears to be no stronger currently than in the fourth quarter. This is disappointing to sales managers who had expected an upsurge in buying, principally on automotive account.

Pressure For Hot Bars—Shippers of hot-rolled carbon bars are more optimistic than are the cold-finished bar sellers. They say demand is equal to supply and anticipate a good first quarter. They have not yet opened books for second quarter.

Inquiry for large hot-rolled carbon rounds and flats is reported to be active, but some easing in demand is noted for the small and medium sizes. Business in these items is still good, but it does not appear to be as pressing as it was some time back.

Both hot and cold-drawn alloy

bars are moving none too well. Delivery of hot alloys is available for February.

Back To Normal—Reports from the West Coast are to the effect demand for bars has returned to normal following the holiday letup in general manufacturing activity. Although January volume in the area is not up to expectations, producers are operating close to capacity. March books are said to be virtually full.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 115

Concrete reinforcing steel bar distributors are building heavy order backlogs for spring shipment, and are preparing for an expected sharp upsurge in demand with the coming of building weather. In New England, for example, current bookings of distributors are reported in excess of shipments. Prices there also have a firmer tone.

Most fabricators are booked to a point covering the availability of steel over the next couple months. Consequently, in some areas there is less competition for new business.

The current lull in orders for highway mesh will fade out in March when highway building is actively resumed. Building mesh demand already is reported on the upswing. Sheet piling is currently the tightest of reinforcing steel products, deliveries extending into 1958.

Tubular Goods . . .

Tubular Goods Prices, Page 119

Major producers of oil country tubing think oil field activity will be stronger this year than in 1956, and they expect they will be called upon to supply a much larger tonnage of pipe. Consequently, they are setting plans to operate pipe mills at capacity through the first half of the year.

Several of the larger producers have not yet opened their books for second quarter orders. However, they could sell out the quarter's production without difficulty.

Most other tubular items are moving well, including seamless specialties, pressure and mechanical tubing. The only dullness at present is in standard pipe for

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plumbing and heating applications. This area of the market is in a seasonal slump which should end in March or April.

More than 1000 tons of cast iron pipe were awarded recently in the Pacific Northwest.

Babcock & Wilcox Co. increased prices about 4 per cent on seamless stainless tubes containing nickel and produced at its Beaver Falls, Pa., and Milwaukee plants. The increase was effective midnight Jan. 8. The boost reflects increased costs of raw materials, including nickel.

Ferroalloys . . .

Ferroalloy Prices, Page 122

The New Jersey Zinc Co. advanced spiegeleisen $3 a ton to $100.50 for 16-19 per cent, $102.50 for 19-21 per cent, and $105 for 21-23 per cent, effective Jan. 7. The higher prices do not apply to orders accepted prior to that date for shipment in January or February, 1957.

Bethlehem Steel Co. increased ferromanganese $20 a ton to $255, Johnstown, Pa., effective Jan. 1. The U.S. Steel Corp. has taken similar action. At the same time, Anaconda Co. increased its price $20 a ton to $263, f.o.b. Anaconda or Great Falls, Mont.

Plates . . .

Plate Prices, Page 115

Producers generally are following the lead of Bethlehem Steel Co., Bethlehem, Pa., in revising extras upward on hot-rolled carbon steel plates.

Bethlehem's changes were made effective as of Dec. 28. Lukens Steel Co., Coatesville, Pa., and Alan Wood Steel Co., Conshohocken, Pa., followed Dec. 31. Inland Steel Co., Chicago, and Youngstown Sheet & Tube Co., Youngstown, announced the change as of Jan. 1. Republic Steel Corp. and several others had not formally taken action up to late last week, but they had the matter under consideration.

The changes announced by Bethlehem affected extras for chemistry, size and chemistry combined with mechanical properties. Adjustments also were made in such extras as those for published specifications.

Up Less Than 5 Per Cent — The net effect of the changes, said Bethlehem, is an advance of less than 5 per cent of the average selling value. Youngstown Sheet & Tube, announcing the increase on both carbon and high-strength low-alloy steel plates, said the adjustment ranged from $1 to $7 a ton applicable to thickness and width, length, quality, specification and chemical content.

Inland Steel Co. said the increase would amount to less than 5 per cent. Lukens said the same.

In addition to revising its extras, Alan Wood Steel raised its base price on carbon plates $1 a ton to $4.95, f.o.b. mill. The company still has an advantage on shipments into Philadelphia and is on a parity at New York with Bethlehem on the latter's shipments from Sparrows Point. It has a slight advantage over Bethlehem at Boston.

Pressure Continues — Demand for plates is stronger than ever, though the immediate situation is eased somewhat by Bethlehem's decision to continue production at its Sparrows Point mill until Feb. 1 before suspending operations for expansion. Suspension originally was scheduled for Jan. 1. Electrification of the 126-in. plate mill at Phoenix Iron & Steel Co.'s Harrisburg, Pa., works is expected this month. This should help to relieve plate supply to some extent.

When the plate mills begin opening books for second quarter, they will figure on set-asides of around 11 per cent of total production for government rated work, unless they hear something to the contrary from Washington.

Set-Asides Were Increased—The government set-asides were increased from 8 per cent for the fourth quarter to 10 per cent for the first quarter this year, and later were stepped up another 1 percentage point for March. The inference of plate producers at the time of this action was that the 11 per cent will continue until further notice.

So far as can be seen, about the only improvement in plate supply conditions appears to have been in light gage, narrow carbon and low alloy grades from the sheet-strip mills.

Sold Far Ahead — Heavy, wide plates and specialties, including higher quality grades, are sold as far ahead as the mills will accept orders.

None of the large plate using industries will ease up in their demands for the next six months or beyond. Heavy electrical equipment backlogs assure peak orders through 1957.

Importing Tonnage — Plate supplies are so scarce on the Pacific Coast that the smaller fabricators are finding it difficult to bid on jobs involving sizable tonnages. One Seattle shop has imported steel from Australia, Japan and Chile in an effort to get sufficient steel to satisfy requirements.

Structural Shapes . . .

Structural Shape Prices, Page 115

Effective with shipments Dec. 28. Bethlehem Steel Co. revised extras applicable to hot-rolled carbon steel structural shapes, both wide flange and standard. Other producers followed, including Phoenix Iron & Steel Co. Some of the higher delivered prices also reflect the recent increase in freight rates.

The principal changes were in section extras and in those for cutting to lengths. There also were adjustments in extras covering chemical and physical properties, item quantity, milling, cambering, slitting, painting and test requirements.

Some extras were increased, some reduced and some held unchanged. It is estimated the net effect of the changes is an advance of less than 4 per cent of the average selling values of wide flange and standard structural shapes. In the case of Jones & Laughlin Steel Corp. the changes result in an increase of 30 cents per 100 pounds on all sizes of standard channels; 20 cents on junior beams; 30 cents on junior channels; standard angles: 5 by 3½-in. to 6 by 6-in. up 25 cents to 40 cents per 100 pounds; 3½ by 3½-in. to 5 by 3-in., up 20 cents to 25 cents; 3 by 2-in. to 3½ by 3-in., up 10 cents to 30 cents.

Wide Flange Price UP—Inland Steel also effected a new base price of $5.25 per 100 pounds for wide flange shapes, an increase of 25 cents. The base price on its standard structurals remains unchanged at $5. The increase in its delivered prices resulting from the revision in extras amounts to less than 5

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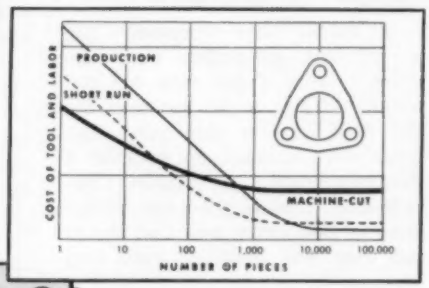

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per cent in the company's selling prices.

Users are taking all the steel they can obtain. There is some letup in demand for smaller angles, but requirements for large angles and wide-flange beams are so strong that no change in over-all demand is noted. The shortage of steel may delay some road construction planned for this summer.

Contracts for fabricated steel, 100 tons or more, totaled 190,500 tons in New England during 1956. a new peak. Bookings in 1955 were 165,000 tons, and in 1954 only 138,000.

Warehouse . . .

Warehouse Prices, Page 120

A general upward revision in warehouse steel prices is pending. The price changes will take into account principally the adjustments in mill extras on several products. They also will reflect certain changes in base prices and advances in railroad and trucking rates.

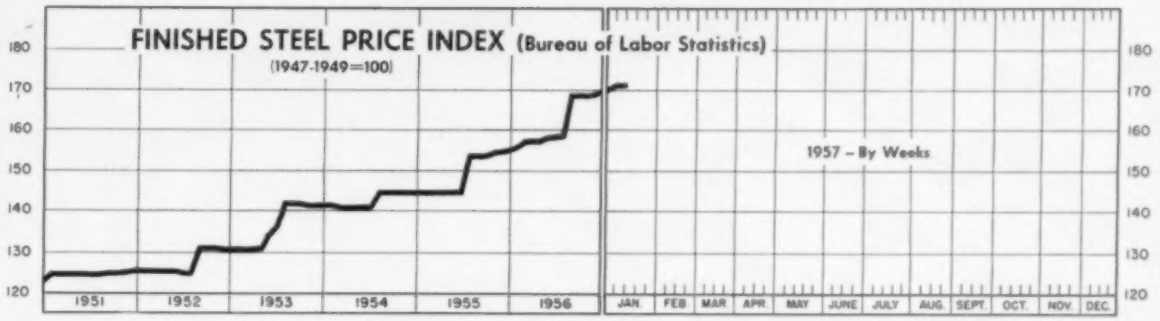
Distributors in most districts recovered quickly from the yearend slowdown. With inventory reductions generally completed, sales to small consumers are rising. Distributors see no cause for a decline in demand during the first half.

Seek Deferments — Buying interest lags in sheets. Inventories of cold-rolled and galvanized sheets have reached the point where some distributors have asked for deferments in mill shipments. A few cancellations of orders for these items have been noted.

Demand is extremely strong for plates and shapes. Tonnages of these products are moving out of warehouses about as fast as they are received from the mills. Some additional quantities of light plate (¼ and ½-in. in thickness) have been offered to warehouses in the Pittsburgh district.

Partial alleviation of the critical shortage of structural steel on the East Coast has been achieved with the help of one New Jersey steel distributor, Morrison Steel Co., New Brunswick, N. J. Fifty carloads (1000 tons) of structural steel have been received by Morrison from Bethlehem Pacific Coast Steel Corp. The order was the maximum accepted by this producer.

Price Indexes and Composites



Jan. 8, 1957	Week Ago	Month Ago	Dec. Avg.	Year Ago
171.3	171.3	168.8	168.8	155.7

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Jan. 8

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard, No. 1	$5.150	Bars, Reinforcing	5.738
Rails, Light, 40 lb	6.567	Bars, C.F., Carbon	9.610
Tie Plates	6.025	Bars, C.F., Alloy	13.275
Axles, Railway	9.150	Bars, C.F., Stainless, 302 (lb)	0.533
Wheels, Freight Car, 33 in. (per wheel)	57.50	Sheets, H.R., Carbon	5.945
Plates, Carbon	5.783	Sheets, C.R., Carbon	6.789
Structural Shapes	5.650	Sheets, Galvanized	8.220
Bars, Tool Steel, Carbon (lb)	0.480	Sheets, C.R., Stainless, 302 (lb)	0.660
Bars, Tool Steel Alloy, Oil Hardening Die (lb)	0.585	Sheets, Electrical	11.225
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.274	Strip, C.R., Carbon	8.843
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.769	Strip, C.R., Stainless, 403 (lb)	0.475
Bars, H.R., Alloy	10.025	Strip, H.R., Carbon	6.000
Bars, H.R., Stainless, 303 (lb)	0.508	Pipe, Black, Buttweld (100 ft)	18.376
Bars, H.R., Carbon	5.925	Pipe, Galv. Buttweld (100 ft)	22.516
		Pipe, Line (100 ft)	182.860
		Casing, Oil Well, Carbon (100 ft)	178.046
		Casing, Oil Well, Alloy (100 ft)	276.870
		Tubes, Boiler (100 ft)	45.033
		Tubing, Mechanical, Carbon (100 ft)	22.973
		Tubing, Mechanical, Stainless, 304 (100 ft)	187.133
		Tin Plate, Hot-dipped, 1.25 lb	9.433
		Tin Plate, Electrolytic, 0.25 lb	8.133
		Black Plate, Canmaking Quality	7.233
		Wire, Drawn, Carbon	9.175
		Wire, Drawn, Stainless, 430 (lb)	0.630
		Bale Ties (bundle)	7.213
		Nails, Wire, 8d Common	9.365
		Wire, Barbed (80-rod spool)	8.412
		Woven Wire Fence (20-rod roll)	20.505

STEEL's FINISHED STEEL PRICE INDEX*

	Jan. 9 1957	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	225.92	225.92	225.92	209.10	171.92
Index in cents per lb	6.111	6.111	6.111	5.665	4.657

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel NT*	$137.98	$137.98	$137.66	$128.00	$106.32
No. 2 Fdry Pig Iron, GT	62.63	62.63	62.63	58.99	52.54
Basic Pig Iron, GT	62.18	62.18	62.18	58.49	52.16
Malleable Pig Iron, GT	63.41	63.41	63.41	59.77	53.27
Steelmaking Scrap, GT	60.83	63.17	65.50	53.33	43.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1953, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Jan. 9 1957	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	5.075	5.075	5.075	4.65	3.70
Bars, H.R., Chicago	5.075	5.075	5.075	4.65	3.70
Bars, H.R., deld, Philadelphia	5.365	5.365	5.35	4.90	4.223
Bars, C.F., Pittsburgh	6.85*	6.85*	6.85*	5.90	4.55
Shapes, Std., Pittsburgh	5.00	5.00	5.00	4.60	3.65
Shapes, Std., Chicago	5.00	5.00	5.00	4.60	3.65
Shapes, deld., Philadelphia	5.31	5.31	5.29	4.88	3.918
Plates, Pittsburgh	4.85	4.85	4.85	4.50	3.70
Plates, Chicago	4.55	4.55	4.85	4.50	3.70
Plates, Coatesville, Pa.	5.25	5.25	5.25	4.80	4.15
Plates, Sparrows Point, Md.	4.85	4.85	4.85	4.50	3.70
Plates, Claymont, Del.	5.70	5.70	5.35	4.80	4.15
Sheets, H.R., Pittsburgh	4.675	4.675	4.675	4.325	3.60-3.75
Sheets, H.R., Chicago	4.675	4.675	4.675	4.325	3.60
Sheets, C.R., Pittsburgh	5.75	5.75	5.75	5.325	4.35
Sheets, C.R., Chicago	5.75	5.75	5.75	5.325	4.35
Sheets, C.R., Detroit	5.75-5.85	5.75-5.85	5.75-5.85	5.325-5.425	4.55
Sheets, Galv., Pittsburgh	6.30	6.30	6.30	5.85	4.80
Strip, H.R., Pittsburgh	4.675	4.675	4.675	4.325	3.75-4.00
Strip, H.R., Chicago	4.675	4.675	4.675	4.325	3.50
Strip, C.R., Pittsburgh	6.85	6.85	6.85	6.25	4.65-5.35
Strip, C.R., Chicago	6.85	6.85	6.85	6.25-6.35	4.90
Strip, C.R., Detroit	6.95	6.95	6.95	6.35	4.85-5.60
Wire, Basic, Pittsburgh	7.20	7.20	7.20	6.60	4.85-5.10
Nails, Wire, Pittsburgh	8.20	8.20	8.20	7.60	5.90-6.20
Tin plate (1.50 lb), box, Pitts.	$9.95	$9.95	$9.95	$9.45	$8.70

*Including 0.35c for special quality

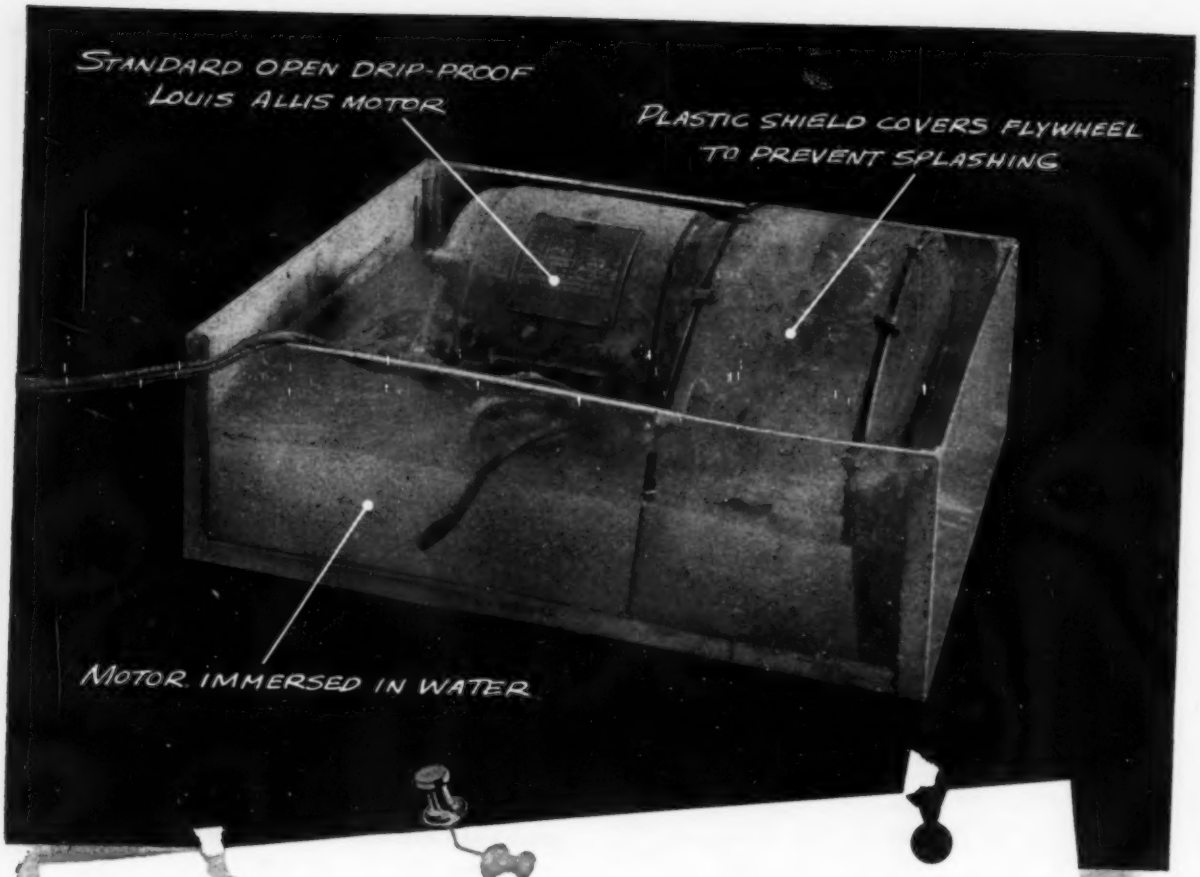
SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$91.50	$91.50	$91.50	$84.50	$66.00
Wire rods, $\frac{7}{32}$-$\frac{9}{16}$" Pitts.	5.80	5.80	5.80	5.025	4.10-4.30

PIG IRON, Gross Ton	Jan. 9 1957	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bessemer, Pitts.	$63.50	$63.50	$63.50	$59.50	$53.00
Basic, Valley	62.50	62.50	62.50	58.50	52.00
Basic, deld. Phila.	66.38	66.38	66.26	62.16	56.61
No. 2 Fdry, NevilleIsland,Pa.	63.00	63.00	63.00	59.00	52.50
No. 2 Fdry, Chicago	63.00	63.00	63.00	59.00	52.50
No. 2 Fdry, deld. Phila.	66.88	66.88	66.76	62.66	57.11
No. 2 Fdry, Birm.	59.00	59.00	59.00	55.00	48.88
No. 2 Fdry (Birm.) deld. Cin.	66.70	66.70	66.70	62.70	55.49
Malleable, Valley	63.00	63.00	63.00	59.00	52.50
Malleable, Chicago	63.00	63.00	63.00	59.00	52.50
Ferromanganese, Duquesne	255.00†	255.00†	235.00†	205.00†	188.00**

†74-76% Mn, net ton. **75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$62.50	$62.50	$66.50	$54.50	$44.00
No. 1 Heavy Melt, E. Pa.	61.00	63.00	63.00	55.00	42.50
No. 1 Heavy Melt, Chicago	59.00	64.00	67.00	50.50	42.50
No. 1 Heavy Melt, Valley	63.50	66.50	66.50	58.50	44.00
No. 1 Heavy Melt, Cleve.	60.50	63.50	65.00	54.50	43.00
No. 1 Heavy Melt, Buffalo	61.50	62.50	62.50	47.50	43.00
Rails, Rerolling, Chicago	84.50	89.50	93.50	72.50	52.50
No. 1 Cast, Chicago	50.50	50.50	50.50	51.50	49.00

COKE, Net Ton					
Beehive, Furn, Connlsvl.	$15.00	$15.00	$15.00	$14.125	$14.75
Beehive, Fdry, Connlsvl.	18.00	18.00	18.00	16.50	17.50



In water 1½ years...still running

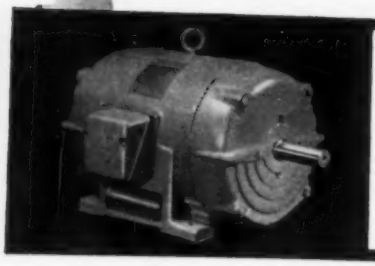
Dramatic proof that Louis Allis motor insulation provides unusual moisture resistance

We wouldn't do this to a motor. But somebody did, to check our new insulation. They took a standard open drip-proof motor, placed it in water up to the shaft, and ran it a year and a half.

The motor will still run, too, which proves that our insulating materials are of top quality. One of our exclusive features is the new phenolic impregnating varnish we use. As you can see, this varnish resists moisture, but it also has excellent thermal and chemical resistance and is not susceptible to embrittlement.

Insulation usually determines the life of a motor. That's why the insulating materials used in the new L. A. line are the product of years of continuous research and development. That's why Louis Allis motors run longer . . . give less trouble.

Find out the many other advantages available to you in the new L. A. line of motors. Write for our new bulletin No. 1700.



A complete line of standard rerated motors in frames 182 through 326U now in stock. Special rerated motors are available on short delivery.

LA-107

THE LOUIS ALLIS CO.
MILWAUKEE 7, WISCONSIN

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. *Changes shown in italics.*
Code numbers following mill points indicate producing company. Key to producers, page 116; to footnotes, page 118.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 .....$70.50

INGOTS, Alloy (NT)
Detroit R7 .....$74.00
Houston 85 .....74.00
Midland,Pa. C18 .....74.00
Munhall,Pa. U5 .....74.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)
Aliquippa,Pa. J5 ....$74.00
Bessemer,Pa. U5 .....74.00
Bridgeport,Conn. N19 ..79.00
Buffalo R2 .....74.00
Clairton,Pa. U5 .....74.00
Ensley,Ala. T2 .....74.00
Fairfield,Ala. T2 .....74.00
Fontana,Calif. K1 ....83.50
Gary,Ind. U5 .....74.00
Johnstown,Pa. B2 .....74.00
Lackawanna,N.Y. B2 ..74.00
LoneStar,Tex. L6 ....80.00
Munhall,Pa. U5 .....74.00
Pittsburgh J5 .....74.00
S.Chicago,Ill. R2, U5..74.00
S.Duquesne,Pa. U5 ...74.00
Sterling,Ill. N15 .....74.00
Youngstown R2 .....74.00

Carbon, Forging (NT)
Aliquippa,Pa. J5 ....$91.50
Bessemer,Pa. U5 .....91.50
Bridgeport,Conn. N19 .96.50
Buffalo R2 .....91.50
Canton,O. R2 .....94.00
Clairton,Pa. U5 .....91.50
Conshohocken,Pa. A3 ..96.50
Ensley,Ala. T2 .....91.50
Fairfield,Ala. T2 .....91.50
Fontana,Calif. K1 ....101.00
Gary,Ind. U5 .....91.50
Geneva,Utah C11 .....91.50
Houston 85 .....96.50
Johnstown,Pa. B2 ....91.50
Lackawanna,N.Y. B2 ..91.50
LosAngeles B3 .....101.00
Midland,Pa. C18 .....91.50
Munhall,Pa. U5 .....91.50
Pittsburgh J5 .....91.50
Seattle B3 .....105.00
S.Chicago R2,U5,W14 91.50
S.Duquesne,Pa. U5 ....91.50
S.SanFrancisco B3 ...101.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ..$107.00
Bridgeport,Conn. N19 107.00
Buffalo R2 .....107.00
Canton,O. R2 .....107.00
Conshohocken,Pa. A3 .114.00
Detroit R7 .....107.00
Fontana,Calif. K1 ....128.00
Gary,Ind. U5 .....107.00
Houston 85 .....112.00
Ind.Harbor,Ind. Y1 ..107.00
Johnstown,Pa. B2 ....107.00
Lackawanna,N.Y. B2 .107.00
LosAngeles B3 .....127.00
Massillon,O. R2 .....107.00
Midland,Pa. C18 .....107.00
Munhall,Pa. U5 .....107.00
S.Chicago R2,U5,W14 107.00
S.Duquesne,Pa. U5 ..107.00
Struthers,O. Y1 .....107.00
Warren,O. C17 .....107.00

ROUNDS, SEAMLESS TUBE (NT)
Bridgeport,Conn. N19 $116.50
Buffalo R2 .....111.50
Canton,O. R2 .....114.00
Cleveland,O. R2 .....111.50
Gary,Ind. U5 .....111.50
S.Chicago,Ill. R2,W14 111.50
S.Duquesne,Pa. U5 ..111.50

SKELP
Aliquippa,Pa. J5 ....4.725
LoneStar,Tex. L6 ....5.025
Munhall,Pa. U5 .....4.625
SparrowsPoint,Md. B2 .4.625
Warren,O. R2 .....4.625
Youngstown R2, U5 ..4.625

WIRE RODS
AlabamaCity,Ala. R2 ..5.80
Aliquippa,Pa. J5 .....5.80
Alton,Ill. L1 .....6.00
Buffalo W12 .....5.80
Cleveland A7 .....5.80
Donora,Pa. A7 .....5.80
Fairfield,Ala. T2 .....5.80
Houston 85 .....6.05
IndianaHarbor,Ind. Y1 .5.80
Johnstown,Pa. B2 .....5.80
Joliet,Ill. A7 .....5.80
KansasCity,Mo. S5 ....6.05
Kokomo,Ind. C16 .....5.90
LosAngeles B3 .....6.60
Minnequa,Colo. C10 ....6.05
Monessen,Pa. P7 .....5.80
N.Tonawanda,N.Y. B11.5.80
Pittsburg,Calif. C11 ....6.45
Portsmouth,O. P12 .....5.80
Roebling,N.J. R5 .....5.90
S.Chicago,Ill. R2 .....5.80
SparrowsPoint,Md. B2 ..5.90
Sterling,Ill.(1) N15 ....5.80
Sterling,Ill. N15 .....5.90
Struthers,O. Y1 .....5.80
Worcester,Mass. A7 ....6.10

STRUCTURALS

Carbon Steel Std. Shapes
Ala.City,Ala. R2 .....5.00
Aliquippa,Pa. J5 .....5.00
Bessemer,Ala. T2 .....5.00
Bethlehem,Pa. B2 .....5.05
Birmingham C15 .....5.30
Clairton,Pa. U5 .....5.00
Fairfield,Ala. T2 .....5.00
Fontana,Calif. K1 .....5.70
Gary,Ind. U5 .....5.00
Geneva,Utah C11 .....5.00
Houston 85 .....5.10
Ind.Harbor,Ind. I-2 ....5.00
Johnstown,Pa. B2 .....5.05
KansasCity,Mo. S5 ....5.10
Lackawanna,N.Y. B2 ...5.05
LosAngeles B3 .....5.70
Minnequa,Colo. C10 ....5.30
Munhall,Pa. U5 .....5.00
Niles,Calif. P1 .....5.75
Phoenixville,Pa. P4 ....5.85
Portland,Oreg. O4 .....5.80
Seattle B3 .....5.75
S.Chicago,Ill. U5, W14 ..5.00
S.SanFrancisco B3 ....5.65
Sterling,Ill. N15 .....5.00
Torrance,Calif. C11 ....5.70
Weirton,W.Va. W6 ....5.00

Wide Flange
Bethlehem,Pa. B2 .....5.05
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 .....5.85
IndianaHarbor,Ind. I-2 ..5.25
Lackawanna,N.Y. B2 ...5.05
Munhall,Pa. U5 .....5.00
Phoenixville,Pa. P4 ....5.85
S.Chicago,Ill. U5 .....5.00

Alloy Std. Shapes
Clairton,Pa. U5 .....6.20
Gary,Ind. U5 .....6.20
Houston 85 .....6.30
Munhall,Pa. U5 .....6.20
S.Chicago,Ill. U5 .....6.20

H.S., L.A. Std. Shapes
Aliquippa,Pa. J5 .....7.35
Bessemer,Ala. T2 .....7.35
Bethlehem,Pa. B2 .....7.40
Clairton,Pa. U5 .....7.35
Fairfield,Ala. T2 .....7.35
Fontana,Calif. K1 .....8.05
Gary,Ind. U5 .....7.35
Geneva,Utah C11 .....7.35
Houston 85 .....7.45
Ind.Harbor,Ind. I-2,Y1 7.35
Johnstown,Pa. B2 .....7.40
KansasCity,Mo. S5 ....7.45
Lackawanna,N.Y. B2 ..7.40
LosAngeles B3 .....8.05
Munhall,Pa. U5 .....7.35
Seattle B3 .....8.10
S.Chicago,Ill. U5, W14..7.35
S.SanFrancisco B3 ....8.00
Struthers,O. Y1 .....7.35

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....7.40
Ind.Harbor,Ind. I-2 ....7.35
Lackawanna,N.Y. B2 ..7.40
Munhall,Pa. U5 .....7.35
S.Chicago,Ill. U5 .....7.35

PILING

BEARING PILES
Bethlehem,Pa. B2 .....5.05
Lackawanna,N.Y. B2 ..5.05
Munhall,Pa. U5 .....5.00
S.Chicago,Ill. U5 .....5.00

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ...5.90
Lackawanna,N.Y. B2 ..5.90
Munhall,Pa. U5 .....5.90
S.Chicago,Ill. U5 .....5.90

PLATES

PLATES, Carbon Steel
Ala.City,Ala. R2 .....4.85
Aliquippa,Pa. J5 .....4.85
Ashland,Ky. (15) A10..4.85
Bessemer,Ala. T2 .....4.85
Bridgeport,Conn. N19 ..4.75
Clairton,Pa. U5 .....4.85
Claymont,Del. C22 .....5.70
Cleveland J5, R2 .....4.95
Coatesville,Pa. L7 .....5.75
Conshohocken,Pa. A3 ....4.95
Detroit M1 .....4.95
Ecorse,Mich. G5 .....4.95
Fairfield,Ala. T2 .....4.85
Fontana,Calif.(30) K1 ..5.55
Gary,Ind. U5 .....4.85
Geneva,Utah C11 .....4.85
GraniteCity,Ill. G4 ....5.05
Harrisburg,Pa. P4 .....5.80
Houston 85 .....4.95
Ind.Harbor,Ind. I-2, Y1 .4.85
Johnstown,Pa. B2 .....4.85
Lackawanna,N.Y. B2 ...4.85
LoneStar,Tex. L6 .....5.20
Minnequa,Colo. C10 ....5.70
Munhall,Pa. U5 .....4.85
Newport,Ky. N9 .....4.85
Pittsburgh J5 .....4.85
Riverdale,Ill. A1 .....4.85
Seattle B3 .....5.75
Sharon,Pa. S3 .....4.85
S.Chicago,Ill. U5, W14 ..4.85
SparrowsPoint,Md. B2 ..4.85
Steubenville,O. W10 ....4.85
Warren,O. R2 .....4.85
Weirton,W.Va. W6 .....4.85
Youngstown R2, U5, Y1 4.85

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 .....6.20
Fontana,Calif. K1 .....6.70
Geneva,Utah C11 .....6.00
Johnstown,Pa. B2 .....5.65
SparrowsPoint,Md. B2 ..5.65

PLATES, Wrought Iron
Economy,Pa. B14 ....11.128

Plates, High-Strength Low-Alloy
Aliquippa,Pa. J5 .....7.25
Bessemer,Ala. T2 .....7.25
Clairton,Pa. U5 .....7.25
Claymont,Del. C22 .....7.55
Cleveland J5, R2 .....7.25
Coatesville,Pa. L7 .....7.55
Conshohocken,Pa. A3 ..7.25
Ecorse,Mich. G5 .....7.35
Fairfield,Ala. T2 .....7.25
Fontana,Calif.(30) K1 .7.95
Gary,Ind. U5 .....7.25
Geneva,Utah C11 .....7.25
Houston 85 .....7.35
Ind.Harbor,Ind. I-2, Y1 7.25
Johnstown,Pa. B2 .....7.25
Munhall,Pa. U5 .....7.25
Pittsburgh J5 .....7.25
Seattle B3 .....8.15
Sharon,Pa. S3 .....7.25
S.Chicago,Ill. U5, W14 .7.25
SparrowsPoint,Md. B2 ..7.25
Warren,O. R2 .....7.25
Youngstown U5, Y1 ....7.25

PLATES, Alloy
Bridgeport,Conn. N19 ..6.55
Claymont,Del. C22 .....6.85
Coatesville,Pa. L7 .....6.85
Fontana,Calif.(30) K1 ..7.55
Gary,Ind. U5 .....6.85
Houston 85 .....6.95
Ind.Harbor,Ind. Y1 .....6.85
Johnstown,Pa. B2 .....6.85
Munhall,Pa. U5 .....6.85
Newport,Ky. N9 .....6.85
Seattle B3 .....7.75
Sharon,Pa. S3 .....6.85
S.Chicago,Ill. U5, W14 .6.85
SparrowsPoint,Md. B2 ..6.85
Youngstown Y1 .....6.85

FLOOR PLATES
Cleveland J5 .....5.925
Conshohocken,Pa. A3 ..5.975
Harrisburg,Pa. P4 ....6.275
Ind.Harbor,Ind. I-2 ...5.925
Munhall,Pa. U5 .....5.925
S.Chicago,Ill. U5 .....5.925

PLATES, Ingot Iron
Ashland c.l. (15) A10 .5.10
Ashland l.c.l. (15) A10 .5.60
Cleveland c.l. R2 .....5.60
Warren,O. c.l. R2 .....5.60

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ..5.075
Aliquippa,Pa.(9) J5 ..5.075
Alton,Ill. L1 .....5.275
Atlanta(9) A11 .....5.575
Bessemer,Ala.(9) T2 ..5.075
Birmingham(9) C15 ..5.375
Bridgeport,Conn. N19 ..5.30
Buffalo(9) R2 .....5.075
Clairton,Pa. U5 .....5.075
Cleveland(9) R2 .....5.075
Ecorse,Mich.(9) G5 ...5.175
Emeryville,Calif. J7 ...5.85
Fairfield,Ala.(9) T2 ..5.075
Fairless,Pa.(9) U5 ....5.225
Fontana,Calif.(9) K1 ..5.775
Gary,Ind.(9) U5 .....5.075
Geneva,Utah(9) C11 ..5.157
Houston(9) 85 .....5.325
Ind.Harbor(9) I-2, Y1 .5.075
Johnstown,Pa.(9) B2 ..5.075
Joliet,Ill. P22 .....5.375
KansasCity,Mo.(9) S5 .5.325
Lackawanna(9) B2 ....5.075
LosAngeles(9) B3 .....5.775
Milton,Pa.(23) M18 ...5.425
Minnequa,Colo. C10 ...5.525
Niles,Calif. P1 .....5.85
N.Tonawanda,N.Y.(9)B11 5.075
Pittsburg,Calif.(9) C11..5.775
Pittsburgh(9) J5 .....5.075
Portland,Oreg. O4 .....5.85
Seattle B3, N14 .....5.825
S.Ch'e'go(9)R2,U5,W14 5.075
S.Duquesne,Pa.(9) U5 .5.075
S.SanFran.,Calif.(9) B3 5.825
Sterling,Ill.(1) N15 ...5.075
Sterling,Ill. N15 .....5.175
Struthers,O. Y1 .....5.075
Torrance,Calif.(9) C11 ..5.775
Weirton,W.Va.(9)W6 ..5.075
Youngstown(9) R2, U5 5.075

BARS, H.R. Leaded Alloy (Including leaded extra)
Warren,O. C17 .....7.125

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 .....6.175
Bridgeport,Conn. N19 ..6.20
Buffalo R2 .....6.125
Canton,O. R2 .....6.125
Clairton,Pa. U5 .....6.125
Detroit R7 .....6.125
Ecorse,Mich. G5 .....6.225
Fairless,Pa. U5 .....6.275
Fontana,Calif. K1 .....7.175
Gary,Ind. U5 .....6.125
Houston 85 .....6.375
Ind.Harbor,Ind. I-2,Y1 6.125
Johnstown,Pa. B2 .....6.125
KansasCity,Mo. S5 ....6.375
Lackawanna,N.Y. B2 ..6.125
LosAngeles B3 .....7.175
Massillon,O. R2 .....6.125
Midland,Pa. C18 .....6.125
S.Chicago R2,U5, W14 6.125
S.Duquesne,Pa. U5 ....6.125
Struthers,O. Y1 .....6.125
Warren,O. C17 .....6.125
Youngstown U5 .....6.125

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy
Aliquippa,Pa. J5 .....7.425
Bessemer,Ala. T2 .....7.425
Bethlehem,Pa. B2 .....7.425
Bridgeport,Conn. N19 ..7.50
Clairton,Pa. U5 .....7.425
Cleveland R2 .....7.425
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.425
Fontana,Calif. K1 .....8.125
Gary,Ind. U5 .....7.425
Houston 85 .....7.675
Ind.Harbor,Ind. Y1 .....7.425
Johnstown,Pa. B2 .....7.425
KansasCity,Mo. S5 ....7.675
Lackawanna,N.Y. B2 ..7.425
LosAngeles B3 .....8.125
Pittsburgh J5 .....7.425
Seattle B3 .....8.175
S.Chicago,Ill. U5, W14 7.425
S.Duquesne,Pa. U5 ....7.425
S.SanFrancisco B3 ....8.175
Struthers,O. Y1 .....7.425
Youngstown U5 .....7.425

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..5.225
Houston 85 .....5.325
KansasCity,Mo. S5 ....5.325
Lackawanna(9) B2 ....5.075
Sterling,Ill. N15 .....5.175
Sterling,Ill.(1) N15 ..5.075

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....5.075
Atlanta A11 .....5.575
Joliet,Ill. P22 .....5.10
Niles,Calif. P1 .....5.85
Pittsburgh J5 .....5.075
Portland,Oreg. O4 .....5.85
SanFrancisco B7 .....5.95

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....6.20
Gary,Ind. U5 .....6.20
Houston 85 .....6.45
KansasCity,Mo. S5 ....6.45
Youngstown U5 .....6.20

BARS, C.F. Leaded Alloy (Including leaded extra)
Ambridge,Pa. W18 ....9.475
BeaverFalls,Pa. M12 ..9.475
Chicago W18 .....9.475
Cleveland C20 .....9.475
LosAngeles S30 .....11.10
LosAngeles P2 .....11.00
Monaca,Pa. S17 .....9.225
Newark,N.J. W18 ....9.65
Warren,O. C17 .....9.475

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....6.85
BeaverFalls,Pa. M12,R2 6.85
Bridgeport,Conn. N19 ..7.20
Buffalo B5 .....6.90
Camden,N.J. P13 .....7.30
Carnegie,Pa. C12 .....6.85
Chicago W18 .....6.85
Cleveland A7, C20 ....6.85
Detroit B5, P17 .....7.05
Detroit R7 .....6.85
Donora,Pa. A7 .....6.85
Elyria,O. W8 .....6.85
FranklinPark,Ill. N5 ....6.85
Gary,Ind. U5 .....6.85
GreenBay,Wis. F7 ....6.85
Hammond,Ind. L2, M13..6.85
Hartford,Conn. R2 ....7.35
Harvey,Ill. B5 .....6.85
LosAngeles(49) S30 ....8.30
LosAngeles P2, R2 ....8.30
Mansfield,Mass. B5 ....7.40
Massillon,O. R2, R8 ....6.85
Midland,Pa. C18 .....6.85
Monaca,Pa. S17 .....6.85
Newark,N.J. W18 .....7.30
NewCastle,Pa.(17) B4 ..6.85
Pittsburgh J5 .....6.85
Plymouth,Mich. P5 ....7.10
Putnam,Conn. W18 ....7.40
Readville,Mass. C14 ....7.40
S.Chicago,Ill. W14 ....6.85
SpringCity,Pa. K3 ....7.30
Struthers,O. Y1 .....6.85
Waukegan,Ill. A7 .....6.85
Youngstown F3, Y1 ....6.85

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19..6.10

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....8.325
BeaverFalls,Pa.M12,R2 8.325
Bethlehem,Pa. B2 ....8.325
Bridgeport,Conn. N19 ..8.475
Buffalo B5 .....8.325
Camden,N.J. P13 .....8.50
Canton,O. T7 .....7.425
Carnegie,Pa. C12 .....8.325
Chicago W18 .....8.325
Cleveland A7, C20 ....8.325
Detroit B5, P17 .....8.525
Detroit R7 .....8.325
Donora,Pa. A7 .....8.325
Elyria,O. W8 .....8.325
FranklinPark,Ill. N5 ..8.325
Gary,Ind. R2 .....8.325
GreenBay,Wis. F7 ....8.325
Hammond,Ind. L2, M13 8.325
Hartford,Conn. R2 ....8.625
Harvey,Ill. B5 .....8.325
Lackawanna,N.Y. B2 ..8.325
LosAngeles P2, S30 ..10.10
Mansfield,Mass. B5 ..8.625
Massillon,O. R2, R8 ..8.325
Midland,Pa. C18 .....8.325
Monaca,Pa. S17 .....8.325
Newark,N.J. W18 .....8.50
Plymouth,Mich. P5 ....8.525
S.Chicago W14 .....8.325
SpringCity,Pa. K3 ....8.50
Struthers,O. Y1 .....8.325
Warren,O. C17 .....8.325
Waukegan,Ill. A7 .....8.325
Worcester,Mass. A7 ..8.625
Youngstown F3, Y1 ..8.325

BARS, Reinforcing (To Fabricators)
Ala.City,Ala. R2 .....5.075
Atlanta A11 .....5.575
Birmingham C15 .....5.375
Bridgeport,Conn. N19 ..5.30
Buffalo R2 .....5.075
Cleveland R2 .....5.075
Ecorse,Mich. G5 .....5.425
Emeryville,Calif. J7 ...5.85
Fairfield,Ala. T2 .....5.075
Fairless,Pa. U5 .....5.225

Ft.Worth,Tex.(42) T4 .5.525
Gary,Ind. U5 .....5.075
Houston S5 .....5.325
Ind.Harbor,Ind. I-2, Y1 5.075
Johnstown,Pa. B2 ....5.075
Joliet,Ill. P22 .....5.575
KansasCity,Mo. S5 ....5.325
Lackawanna,N.Y. B2 ..5.075
LosAngeles B3 .....5.775
Milton,Pa. M18 .....5.225
Minnequa,Colo. C10 ...5.525
Niles,Calif. P1 .....5.85
Pittsburg,Calif. C11 ..5.775
Pittsburgh J5 .....5.075
Portland,Oreg. O4 .....5.65
SandSprings,Okla. S5 ..5.575
Seattle B3, N14 .....5.825
S.Chicago,Ill. R2 .....5.075
S.Duquesne,Pa. U5 ....5.075
S.SanFrancisco B3 ....5.825
SparrowsPoint,Md. B2..5.075
Sterling,Ill.(1) N15 ...5.075
Sterling,Ill. N15 .....5.175
Struthers,O. Y1 .....5.075
Torrance,Calif. C11 ...5.775
Youngstown R2, U5 ...5.075

BARS, Reinforcing (Fabricated; to Consumers)

Chicago U8 .....6.81
Cleveland U8 .....6.79
Johnstown,Pa. ¼-1" B2..6.73
KansasCity,Mo. S5 .....7.00
Marion,O. P11 .....6.70
NewYork U8 .....7.18
Pittsburgh U8 .....6.75
Seattle B3, N14 .....7.20
SparrowsPt. ¼-1" B2 ..6.73
Williamsport,Pa. S19 ...6.65

RAIL STEEL BARS

ChicagoHts.(3) C2, I-2.5.075
ChicagoHts.(4) I-2 ....5.075
ChicagoHts.(4) C2 .....5.65
Ft.Worth,Tex.(26) T4..5.525
Franklin,Pa.(4) F5 ....5.60
Franklin,Pa.(3) F5 ....5.10
JerseyShore,Pa.(4) J5 ..5.00
Marion,O.(3) P11 .....5.15
Moline,Ill.(3) R2 .....5.225
Tonawanda(3) B12 .....5.65
Tonawanda(4) B12 .....6.15
Williamsport,Pa.(3) S19.5.65

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 12.305
Economy,Pa.(D.R.)B14 15.301
Economy(Staybolt)B14 15.676
McK.Rks.(S.R.) L5 ...13.15
McK.Rks.(D.R.) L5 ...15.00
McK.Rks.(Staybolt) L5.19.50

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Ala.City,Ala. R2 .....4.675
Allenport,Pa. P7 .....4.675
Ashland,Ky.(8) A10 ..4.675
Cleveland J5, R2 .....4.675
Conshohocken,Pa. A3 ..4.725
Detroit(8) M1 .....4.775
Dravosburg,Pa. U5 ....4.675
Ecorse,Mich. G5 .....4.775
Fairfield,Ala. T2 .....4.675
Fairless,Pa. U5 .....4.725
Fontana,Calif. K1 ....5.475
Gary,Ind. U5 .....4.675
Geneva,Utah C11 .....4.775
GraniteCity,Ill.(8) G4 ..4.875
Ind.Harbor,Ind. I-2, Y1 4.675
Lackawanna,N.Y. B2 ..4.675
Munhall,Pa. U5 .....4.675
Newport,Ky.(8) N9 ...4.675
Niles,O. M21 .....4.675
Pittsburg,Calif. C11 ...5.375
Pittsburgh J5 .....4.675
Portsmouth,O. P12 ....4.675
Riverdale,Ill. A1 .....4.675
Sharon,Pa. S3 .....4.675
S.Chicago,Ill. W14 ....4.675
SparrowsPoint,Md. B2. .4.675
Steubenville,O. W10 ...4.675
Warren,O. R2 .....4.675
Weirton,W.Va. W6 ....4.675
Youngstown U5, Y1 ...4.675

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21 .....5.75

SHEETS, H.R. Alloy

Dravosburg,Pa. U5 ....7.75
Gary,Ind. U5 .....7.75
Ind.Harbor,Ind. Y1 ....7.75
Newport,Ky. N9 .....7.75
Youngstown Y1, U5 ....7.75

SHEETS, H.R. (14 Ga. & Heavier) High-Strength Low-Alloy

Cleveland J5, R2 .....6.90
Conshohocken,Pa. A3 ...6.95
Dravosburg,Pa. U5 .....6.90
Ecorse,Mich. G5 .....7.00
Fairfield,Ala. T2 .....6.90
Fairless,Pa. U5 .....6.95
Fontana,Calif. K1 .....7.70
Gary,Ind. U5 .....6.90
Ind.Harbor,Ind. I-2, Y1 6.90
Lackawanna(35) B2 ....6.90
Munhall,Pa. U5 .....6.90
Pittsburgh J5 .....6.90
S.Chicago,Ill. U5 .....6.90
SparrowsPoint(36) B2 ..6.90
Warren,O. R2 .....6.90
Weirton,W.Va. W6 ....6.90
Youngstown U5, Y1 ....6.90

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ...4.925
Cleveland R2 .....5.425
Ind.Harbor,Ind. I-2 ...4.925
Warren,O. R2 .....5.425

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 .....5.75
Cleveland J5, R2 .....5.75
Conshohocken,Pa. A3 ...5.80
Detroit M1 .....5.75
Dravosburg,Pa. U5 .....5.75
Ecorse,Mich. G5 .....5.85
Fairfield,Ala. T2 .....5.75
Fairless,Pa. U5 .....5.80
Follansbee,W.Va. F4 ...5.75
Fontana,Calif. K1 .....6.95
Gary,Ind. U5 .....5.75
GraniteCity,Ill. G4 .....5.95
Ind.Harbor,Ind. I-2, Y1 5.75
Lackawanna,N.Y. B2 ..5.75
Mansfield,O. E6 .....5.75
Middletown,O. A10 .....5.75
Newport,Ky. N9 .....5.75
Pittsburg,Calif. C11 ....6.70
Pittsburgh J5 .....5.75
Portsmouth,O. P12 .....5.75
SparrowsPoint,Md. B2...5.75
Steubenville,O. W10 ....5.75
Warren,O. R2 .....5.75
Weirton,W.Va. W6 ....5.75
Yorkville,O. W10 .....5.75
Youngstown Y1 .....5.75

SHEETS, Cold-Rolled High-Strength, Low-Alloy

Cleveland J5, R2 .....8.525
Dravosburg,Pa. U5 ....8.525
Ecorse,Mich. G5 .....8.625
Fairless,Pa. U5 .....8.575
Fontana,Calif. K1 .....9.725
Gary,Ind. U5 .....8.525
IndianaHarbor,Ind. Y1.8.525
Lackawanna(37) B2 ...8.525
Pittsburgh J5 .....8.525
SparrowsPoint(38) B2 .8.525
Warren,O. R2 .....8.525
Weirton,W.Va. W6 ....8.525
Youngstown Y1 .....8.525

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....6.50
Middletown,O. A10 ....6.25
Warren,O. R2 .....6.50

SHEETS, Culvert

	Cu Steel	Cu Fe
Ashland,Ky. A10	6.65	6.90
Canton,O. R2	6.65	7.15
Dravosburg U5	6.65	6.90
Fairfield T2	6.65	6.90
Gary,Ind. U5	6.65	6.90
GraniteCity,Ill. G4	6.85	...
Ind.Harbor I-2	6.65	6.90
Kokomo,Ind. C16	6.75	...
MartinsFry. W10	6.65	...
Pittsburgh J5	...	6.65
Pitts.,Calif. C11	7.40	...
SparrowsPt. B2	6.65	...

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ....6.90
MartinsFry.,O. W10 ....6.90

SHEETS, Galvanized Steel Hot-Dipped

Ala.City,Ala. R2 .....6.30‡
Ashland,Ky. A10 .....6.30†
Canton,O. R2 .....6.30‡
Dover,O. R1 .....6.30†
Dravosburg,Pa. U5 ....6.30‡
Fairfield,Ala. T2 .....6.30†
Gary,Ind. U5 .....6.30‡
GraniteCity,Ill. G4 ....6.50*
Ind.Harbor,Ind. I-2 ...6.30‡
Kokomo,Ind. C16 .....6.40‡
MartinsFerry,O. W10 ..6.30*
Middletown,O. A10 ...6.30†
Pittsburg,Calif. C11 ...7.05*
Pittsburgh J5 .....6.30†
SparrowsPt.,Md. B2 ..6.30‡
Warren,O. R2 .....6.30†
Weirton,W.Va. W6 ....6.30*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....6.975

SHEETS, Galvanized High-Strength Low-Alloy

Dravosburg,Pa. U5 ...9.275
SparrowsPoint(39) B2..9.275

SHEETS, Galvannealed Steel

Canton,O. R2 .....6.70
Dravosburg,Pa. U5 ....6.70
Kokomo,Ind. C16 .....7.00

SHEETS, Galvanized Ingot Iron (Hot-dipped Continuous)

Ashland,Ky. A10 .....6.55
Middletown,O. A10 .....6.55

SHEETS, Electrogalvanized

Cleveland(28) R2 .....7.125
Niles,O.(28) R2 .....7.125
Weirton,W.Va. W6 ....6.975

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 8.95
Butler,Pa. A10 (type 2) 9.05

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.325
Cleveland R2 .....6.325
Dravosburg,Pa. U5 ....6.325
Gary,Ind. U5 .....6.325
GraniteCity,Ill. G4 ....6.525
Ind.Harbor,Ind. I-2, Y1 6.325
Middletown,O. A10 ....6.325
Niles,O. M21 .....6.325
Youngstown Y1 .....6.325

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ...8.35
Ind.Harbor,Ind. I-2 ....8.175
Yorkville,O. W10 .....8.175

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10 6.70
Gary,Ind. U5 .....6.70
Mansfield,O. E6 .....6.70
Middletown,O. A10 .....6.70
Niles,O. M21 .....6.70
Weirton,W.Va. W6 .....6.70

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 .....7.10

Key To Producers

A1 Acme Steel Co.
A2 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U.S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div. Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Dearborn Division Sharon Steel Corp.
D4 Disston & Sons, Henry
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 EasternGas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div., Jones & Laughlin Steel Corp.
M14 McInnes Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Division, Merritt-Chapman & Scott
M21 Mallory-Sharon Titanium Corp.

N1 National Standard Co.
N2 National Supply Co.
N3 National Tube Div., U.S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N14 Northwest.SteelRoll.Mill
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
N19 Northeastern Steel Corp.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co. Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div. Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service

T2 Tenn.Coal & Iron Div., U.S. Steel Corp.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U.S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U.S. Steel Supply Div., U.S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Div., H. K. Porter Co. Inc.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W.Va. Steel & Mfg. Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala. City, Ala. (27) R2	4.675
Allenport, Pa. P7	4.675
Alton, Ill. L1	4.875
Ashland, Ky. (8) A10	4.675
Atlanta A11	4.875
Bessemer, Ala. T2	4.675
Birmingham C15	4.975
Bridgeport, Conn. N19	4.625
Buffalo (27) R2	4.675
Conshohocken, Pa. A3	4.725
Detroit M1	4.775
Ecorse, Mich. G5	4.775
Fairfield, Ala. T2	4.6 5
Fontana, Calif. K1	5.475
Gary, Ind. U5	4.675
Houston S5	4.9.5
Ind. Harbor, Ind. I-2, Y1	4.675
Johnstown, Pa. (25) B2	4.675
KansasCity, Mo. S5	4.925
Lackaw'na, N.Y. (25) B2	4.675
LosAngeles (25) B3	5.425
Minnequa, Colo. C10	5.775
Pittsburg, Calif. C11	5.425
Riverdale, Ill. A1	4.675
SanFrancisco S7	5.95
Seattle (25) B3	5.675
Seattle N14	5.675
Sharon, Pa. S3	4.675
S.Chicago, Ill. W14	4.675
S.SanFrancisco (25) B3	5.425
SparrowsPoint, Md. B2	4.675
Sterling, Ill. (1) N15	4.675
Sterling, Ill. N15	4.775
Torrance, Calif. C11	5.425
Warren, O. R2	4.675
Weirton, W.Va. W6	4.675
Youngstown U5	4.675

STRIP, Hot-Rolled Alloy

Bridgeport, Conn. N19	7.50
Carnegie, Pa. S18	7.75
Dravosburg, Pa. U5	7.75
Gary, Ind. U5	7.75
Ind. Harbor, Ind. Y1	7.75
LosAngeles B3	8.95
Newport, Ky. N9	7.75
Sharon, Pa. S3	7.75
S.Chicago, Ill. W14	7.75
Youngstown U5, Y1	7.75

STRIP, Hot-Rolled High-Strength, Low-Alloy

Bessemer, Ala. T2	6.95
Conshohocken, Pa. A3	6.95
Ecorse, Mich. G5	7.05
Fairfield, Ala. T2	6.95
Gary, Ind. U5	6.95
Houston S5	7.20
Ind. Harbor, Ind. I-2, Y1	6.95
KansasCity, Mo. S5	7.20
Lackawanna, N.Y. B2	6.95
LosAngeles (25) B3	7.70
Seattle (25) B3	7.95
Sharon, Pa. S3	6.95
S.SanFrancisco (25) B3	7.70
SparrowsPoint, Md. B2	6.95
Warren, O. R2	6.95
Weirton, W.Va. W6	6.95
Youngstown U5, Y1	6.95

STRIP, Hot-Rolled Ingot Iron

Ashland, Ky. (8) A10	4.925
Warren, O. R2	5.425

STRIP, Cold-Rolled Carbon

Anderson, Ind. G6	6.85
Baltimore T6	6.85
Boston T6	7.40
Buffalo S40	6.85
Cleveland A7, J5	6.85
Conshohocken, Pa. A3	6.90
Dearborn, Mich. D3	6.95
Detroit D2, M1, P20	6.95
Dover, O. G6	6.85
Ecorse, Mich. G5	6.95
Follansbee, W.Va. F4	6.85
Fontana, Calif. K1	8.60
FranklinPark, Ill. T6	6.95
Ind. Harbor, Ind. Y1	6.85
Indianapolis C8	7.00
LosAngeles C1	8.80
NewBedford, Mass. R10	7.30
NewBritain (10) S15	6.85
NewCastle, Pa. B4, E5	6.85
NewHaven, Conn. D2	7.30
NewKensington, Pa. A6	6.85
Pawtucket, R.I. R3	7.50
Pawtucket, R.I. N8	7.40
Pittsburgh J5	6.85
Riverdale, Ill. A1	6.95
Rome, N.Y. (32) R6	6.85
Sharon, Pa. S3	6.85
Trenton, N.J. (31) R5	8 30
Wallingford, Conn. W2	7.30
Warren, O. R2, T5	6.85
Weirton, W.Va. W6	6.85
Worcester, Mass. A7	7.40
Youngstown C8, Y1	6.85

STRIP, Cold-Rolled Alloy

Boston T6	14.90
Carnegie, Pa. S18	14.55
Cleveland A7	14.55
Dover, O. G6	14.55
FranklinPark, Ill. T6	14.55
Harrison, N.J. C18	14.55
Indianapolis C8	14.70
Pawtucket, R.I. N8	14.90
Sharon, Pa. S3	14.55
Worcester, Mass. A7	14.85
Youngstown C8	14.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.00
Dearborn, Mich. D3	10.10
Dover, O. G6	10 10
Ecorse, Mich. G5	10.10
Ind. Harbor, Ind. Y1	10.20
Sharon, Pa. S3	10.00
Warren, O. R2	10.00
Weirton, W.Va. W6	10.20
Youngstown Y1	10.20

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	8.50	10.10	12.30	15.30	18.25
Boston T6	8.50	10.10	12.30	15.30	18.25
Bristol, Conn. W1	...	...	12.30	15.30	18.25
Carnegie, Pa. S18	...	9.80	12.00	15.00	....
Cleveland A7	7.95	9.80	12.00	15.00	17.95
Cleveland C7	...	9.80	12.00	15.00	17.95
Dover, O. G6	7.95	9.80	12.00	15.00	17.95
Detroit D2	8.05	9.90	12.10	15.10	....
Dearborn, Mich. D3	8.05	9.30	12.10	....	....
FranklinPark, Ill. T6	8.05	9.80	12.00	15.00	17.95
Harrison, N.J. C18	...	...	12.30	15.30	18.25
Indianapolis C8	8.10	9.95	12.00	15.00	17.95
NewBritain, Conn. (10) S15	7.95	9.80	12.00	15.00	17.95
NewCastle, Pa. B4, E5	7.95	9.80	12.00	15.00	....
NewHaven, Conn. D2	8.40	10.10	12.30	15.30	....
NewKensington, Pa. A6	7.95	9.80	12.00	15.00	....
NewYork W3	...	10.10	12.30	15.30	18.25
Pawtucket, R.I. N8	8.50	10.10	12.30	15.30	18.25
Riverdale, Ill. A1	8.05	9.80	12.00	15.00	17.95
Rome, N.Y. (32) R6	7.95	9.80	12.00	15.00	17.95
Sharon, Pa. S3	7.95	9.80	12.00	15.00	17.95
Trenton, N.J. R5	...	10.10	12.30	15.30	18.25
Wallingford, Conn. W2	8.40	10.10	12.30	15.30	18.15
Warren, O. T5	7.95	9.80	12.00	15.00	17.95
Weirton, W.Va. W6	7.95	9.80	12.00	15.00	17.95
Worcester, Mass. A7, T6	8.50	10.10	12.30	15.30	18.25
Youngstown C8	7.95	9.80	12.00	15.00	17.95

Spring Steel (Tempered)			Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol, Conn. W1	...	...	16.50	20.65	....
Buffalo W12	...	...	16.50	....	....
FranklinPark, Ill. T6	...	...	17.15	21.00	25.35
Harrison, N.J. C18	...	...	16.50	20.65	25.00
NewYork W3	...	...	16.50	20.65	25.00
Palmer, Mass. W12	...	...	16.50	....	....
Trenton, N.J. R5	...	...	16.50	20.65	25.00
Worcester, Mass. A7, T6	...	...	16.50	20.65	25.00
Youngstown C8	...	...	17.15	21.00	25.35

SILICON STEEL

H.R. SHEETS (22 Ga., cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom, W.Va. W10	...	...	11.00	12.05	13.05
Brackenridge, Pa. A4	...	...	11.00	12.50	13.05
Mansfield, O. E6	9.20	10.35	11.00	12.05	13.05
Newport, Ky. N9	9.20	10.35	11.00	12.05	13.05
Niles, O. M21	9.20	10.35	11.00	12.05	....
Vandergrift, Pa. U5	...	10.35	11.00	12.05	13.05
Warren, O. R2	9.20	10.35	11.00	12.05	....
Zanesville, O. A10	...	10.35	11.00	12.05	13.05
Zanesville, O. A10 (FP coils)	...	10.85	11.525	12.575	13.55
Zanesville, O. A10 (SP coils)	...	....	11.025	12.075	13.05

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge, Pa. A4	....	....	11.525	12.575	13.55
GraniteCity, Ill. G4	9.40*	10.55*	11.225*	12.275*	....
IndianaHarbor, Ind. I-2	9.20†	10.35*	11.025*	12.075*	....
Mansfield, O. E6	9.70	10.85	11.525	12.575	13.55
Vandergrift, Pa. U5	9.20*	10.35*	11.025*	12.075*	13.05*
Vandergrift, Pa. U5	...	10.85†	11.525†	12.575†	13.55†
Warren, O. R2	9.20*	10.85	11.525	12.575	13.55

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grades T-72	T-65	T-58	T-52
BeechBottom, W.Va. W10	14.05	14.60	15.10	16.15
Brackenridge, Pa. A4	14.05	....	....	....
Vandergrift, Pa. U5	14.05	14.60	15.10	16.15
Zanesville, O. A10	14.05	14.60	15.10	16.15

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge, Pa. A4	....	16.90	18.50	19.00	19.50	14.05**
Butler, Pa. A10	....	....	....	18.50	19.00	19.50	....
Vandergrift, Pa. U5	15.90	16.90	18.50	19.00	19.50	14.55**
Warren, O. R2	....	....	....	....	....	14.55‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. **Cut lengths, ¾-cent lower.

STRIP, Galvanized (Continuous)

Sharon, Pa. S3	6.975

TIGHT COOPERAGE HOOP

Atlanta A11	5.40
Riverdale, Ill. A1	5.25
Sharon, Pa. S3	5.10
Youngstown U5	5.10

STRIP, Cold-Rolled Ingot Iron

Warren, O. R2	7.60

STRIP, C.R. Electrogalvanized

Cleveland A7	6.85*
Dover, O. G6	6.85*
Riverdale, Ill. A1	6.95*
Warren, O. B9, T5	6.85*
Worcester, Mass. A7	7.40*
Youngstown C8	6.85*

*Plus galvanizing extras.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa, Pa. J5	$8.40	$8.65	$9.05
Dravosburg, Pa. U5	8.40	8.65	9.05
Fairfield, Ala. T2	8.50	8.75	9.15
Fairless, Pa. U5	8.50	8.75	9.15
Fontana, Calif. K1	9.15	9.40	9.80
Gary, Ind. U5	8.40	8.65	9.05
GraniteCity, Ill. G4	8.50	8.75	9.15
IndianaHarbor, Ind. I-2, Y1	8.40	8.65	9.05
Niles, O. R2	8.40	8.65	9.05
Pittsburg, Calif. C11	9.15	9.40	9.80
SparrowsPoint, Md. B2	8.50	8.75	9.15
Weirton, W.Va. W6	8.40	8.65	9.05
Yorkville, O. W10	8.40	8.65	9.05

ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa, Pa. J5	7.425	....	....
Niles, O. R2	7.425	7.625	7.925

TINPLATE, American	1.25 lb	1.50 lb
Aliquippa, Pa. J5	$9.70	$9.95
Dravosburg, Pa. U5	9.70	9.95
Fairfield, Ala. T2	9.80	10.05
Fairless, Pa. U5	9.80	10.05
Fontana, Calif. K1	10.45	10.70
Gary, Ind. U5	9.70	9.95
Pitts., Calif. C11	10.45	10.70
Sp.Pt., Md. B2	9.80	10.05
Weirton, W.Va. W6	9.70	9.95
Yorkville, O. W10	9.70	9.95

BLACK PLATE (Base Box)

Aliquippa, Pa. J5	$7.50
Dravosburg, Pa. U5	7.50
Fairfield, Ala. T2	7.60
Fairless, Pa. U5	7.60
Fontana, Calif. K1	8.25
Gary, Ind. U5	7.50
GraniteCity, Ill. G4	7.60
Ind. Harbor, Ind. I-2, Y1	7.50
Niles, O. R2	7.50
Pittsburg, Calif. C11	8.25
SparrowsPoint, Md. B2	7.60
Weirton, W.Va. W6	7.50
Yorkville, O. W10	7.50

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa, Pa. J5	$7.15
Dravosburg, Pa. U5	7.15
Gary, Ind. U5	7.15
GraniteCity, Ill. G4	7.25
Ind. Harbor, Ind. Y1	7.15
Yorkville, O. W10	7.15

MANUFACTURING TERNES (Special Coated; Base Box)

Dravosburg, Pa. U5	$9.20
Gary, Ind. U5	9.20

ROOFING SHORT TERNES (8 lb Coated; Base Box)

Gary, Ind. U5	$10.75

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity, Ala. R2	7.20
Aliquippa, Pa. J5	7.20
Alton, Ill. L1	7.40
Atlanta A11	7.40
Bartonville, Ill. K4	7.30
Buffalo W12	7.20
Chicago W13	7.20
Cleveland A7, C20	7.20
Crawfordsville, Ind. M8	7.30
Donora, Pa. A7	7.20
Duluth A7	7.20
Fairfield, Ala. T2	7.20
Fostoria, O. (24) S1	7.30
Houston S5	7.45
Jacksonville, Fla. M8	7.55
Johnstown, Pa. B2	7.20
Joliet, Ill. A7	7.20
KansasCity, Mo. S5	7.45
Kokomo, Ind. C16	7.30
LosAngeles B3	8.15
Minnequa, Colo. C10	7.45
Monessen, Pa. P7, P16	7.20
N.Tonawanda, N.Y. B11	7.20
Palmer, Mass. W12	7.50
Pittsburg, Calif. C11	8.15
Portsmouth, O. P12	7.20
Rankin, Pa. A7	7.20
S.Chicago, Ill. R2	7.20
S.SanFrancisco C10	8.15
SparrowsPoint, Md. B2	7.30
Sterling, Ill. (1) N15	7.20
Sterling, Ill. N15	7.30
Struthers, O. Y1	7.20
Waukegan, Ill. A7	7.20
Worcester, Mass. A7	7.50

WIRE, Gal'd ACSR for Cores

Bartonville, Ill. K4	11.75
Buffalo W12	11.75
Johnstown, Pa. B2	11.75
Minnequa, Colo. C10	11.875
Monessen, Pa. P16	11.75
Muncie, Ind. I-7	11.95
Palmer, Mass. W12	12.05
Pittsburg, Calif. C11	12.55
Portsmouth, O. P12	11.75
Roebling, N.J. R5	12.05
SparrowsPt., Md. B2	11.85
Struthers, O. Y1	11.75

ROPE WIRE (A)

Bartonville, Ill. K4	11.55
Buffalo W12	11.55
Fostoria, O. S1	11.55
Johnstown, Pa. B2	11.55
Monessen, Pa. P7, P16	11.55
Muncie, Ind. I-7	11.75
Palmer, Mass. W12	11.85
Portsmouth, O. P12	11.55
Roebling, N.J. R5	11.85
SparrowsPt., Md. B2	11.65
Struthers, O. Y1	11.55
Worcester, Mass. J4	11.85

(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE, Upholstery Spring

Aliquippa, Pa. J5	8.40
Alton, Ill. L1	8.60
Buffalo W12	8.40
Cleveland A7	8.40
Donora, Pa. A7	8.40
Duluth A7	8.40
Johnstown, Pa. B2	8.40
KansasCity, Mo. S5	8.65
LosAngeles B3	9.35
Minnequa, Colo. C10	8.60
Monessen, Pa. P7, P16	8.40
NewHaven, Conn. A7	8.70
Palmer, Mass. W12	8.70
Pittsburg, Calif. C11	9.35
Portsmouth, O. P12	8.40
Roebling, N.J. R5	8.70
S.Chicago, Ill. R2	8.40
S.SanFrancisco C10	9.35
SparrowsPoint, Md. B2	8.50
Struthers, O. Y1	8.40
Trenton, N.J. A7	8.70
Waukegan, Ill. A7	8.40
Worcester, Mass. A7	8.70

WIRE, MB Spring, High Carbon

Aliquippa, Pa. J5	8.725
Alton, Ill. L1	8.925
Bartonville, Ill. K4	8.825
Buffalo W12	8.725
Cleveland A7	8.725
Donora, Pa. A7	8.725
Duluth A7	8.725
Fostoria, O. S1	8.775
Johnstown, Pa. B2	8.725
LosAngeles B3	9.675
Milbury, Mass. (12) N6	9.025
Minnequa, Colo. C10	8.975
Monessen, Pa. P7, P16	8.725
Muncie, Ind. I-7	8.925
Palmer, Mass. W12	9.025
Pittsburg, Calif. C11	9.675
Portsmouth, O. P12	8.725
Roebling, N.J. R5	9.025
S.Chicago, Ill. R2	8.725
S.SanFrancisco C10	9.675
SparrowsPt., Md. B2	8.825
Struthers, O. Y1	8.725
Trenton, N.J. A7	9.025
Waukegan, Ill. A7	8.725
Worcester A7, J4, T6	9.025

WIRE, Fine & Weaving (8" Coils)

Alton, Ill. L1	14.35
Bartonville, Ill. K4	14.25
Buffalo W12	14.15
Chicago W13	13.55
Cleveland A7	14.15
Crawfordsville, Ind. M8	14.25
Fostoria, O. S1	14.15
Jacksonville, Fla. M8	14.50
Johnstown, Pa. B2	14.15
Kokomo, Ind. C16	14.15
Minnequa, Colo. C10	13.90
Monessen, Pa. P6	14.15
Muncie, Ind. I-7	14.35
Palmer, Mass. W12	14.45
Roebling, N.J. C10	14.45
S.SanFrancisco C10	14.50
Waukegan, Ill. A7	14.15
Worcester, Mass. A7, T6	14.45

WIRE

WIRE, Tire Bead

Bartonville,Ill. K4	15.25
Monessen,Pa. P16	15.45
Roebling,N.J. R5	15.60

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	10.75
Baltimore T6	11.05
Boston T6	11.05
Buffalo W12	10.75
Cleveland A7	10.75
Crawfordsville,Ind. M8	10.75
Dover,O. G6	10.75
Fostoria,O. S1	10.75
FranklinPark,Ill. T6	10.85
Kokomo,Ind. C16	10.75
Massillon,O. R8	10.75
Milwaukee C23	10.95
Monessen,Pa. P7, P16	10.75
NewKensington,Pa. A6	10.75
Palmer,Mass. W12	11.05
Pawtucket,R.I. N8	11.05
Riverdale,Ill. A1	10.85
Rome,N.Y. R6	10.75
Trenton,N.J. R5	11.05
Worcester,Mass. A7, T6	11.05

NAILS & POLISHED STAPLES, Stock

	Col.
AlabamaCity, Ala. R2	.164
Aliquippa,Pa. (7) J5	.167
Atlanta A11	.166
Bartonville,Ill. (7) K4	.169
Crawfordsville,Ind. M8	166
Donora,Pa. A7	.164
Duluth A7	.164
Fairfield,Ala. T2	.164
Houston,Tex. S5	.169
Jack'ville,Fla (20) M8	175
Johnstown,Pa. B2	.164
Joliet,Ill. A7	.164
KansasCity,Mo. S5	.169
Kokomo,Ind. C16	.166
Minnequa,Colo. C10	.169
Monessen,Pa. (7) P7	.167
Pittsburg,Calif. C11	.183
Rankin,Pa. A7	.164
S.Chicago,Ill. R2	.164
SparrowsPt.,Md. B2	.166
Sterling,Ill. (1) N15	.164
Worcester,Mass. A7	.170

NAILS, Stock

	Col.
Chicago (7) W13	.167
Cleveland (7) A9	.173

(To Wholesalers; per cwt)

Galveston,Tex. D7	$8.75

NAILS, Cut (100 lb keg) To Dealers (33)

Conshohocken,Pa. A3	$9.80
Wheeling,W.Va. W10	9.80

TIE WIRE, Automatic Baler (14½ Ga.)(Per 97 lb Net Box) Coil No. 3150

AlabamaCity,Ala. R2	$9.53
Atlanta A11	9.63
Bartonville,Ill. K4	10.13
Buffalo W12	10.05
Crawfordsville,Ind. M8	.9.63
Donora,Pa. A7	9.53
Duluth A7	9.53
Houston S5	9.78
Jack'ville,Fla. M8	10.09
Johnstown,Pa. B2	9.53
Joliet,Ill. A7	9.53
KansasCity,Mo. S5	9.78
Kokomo,Ind. C16	9.63
LosAngeles B3	10.32
Minnequa,Colo. C10	9.78
Pittsburg,Calif. C11	10.31
S.Chicago,Ill. R2	9.53
S.SanFrancisco C10	10.31
SparrowsPt.,Md. B2	9.63
Sterling,Ill.(1) N15	9.53

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$9.85
Atlanta A11	9.95
Bartonville,Ill. K4	10.45
Buffalo W12	10.35
Crawfordsville,Ind. M8	.9.95
Donora,Pa. A7	9.85
Duluth A7	9.85
Houston S5	10.10
Kokomo,Ind. C16	9.95
Jacksonville,Fla. M8	10.41
Johnstown,Pa. B2	9.85
Joliet,Ill. A7	9.85
KansasCity,Mo. S5	10.10
Kokomo,Ind. C16	10.45
LosAngeles B3	10.65
Minnequa,Colo. C10	10.10
Pittsburg,Calif. C11	10.65
S.Chicago,Ill. R2	9.85
S.SanFrancisco C10	10.65
SparrowsPt.,Md. B2	9.95
Sterling,Ill.(1) N15	9.85

Coil Interim

AlabamaCity,Ala. R2	$9.90
Atlanta A11	10.00
Bartonville,Ill. K4	10.50
Buffalo W12	10.40
Crawfordsville,Ind. M8	10.00
Donora,Pa. A7	9.90
Duluth A7	9.90
Houston S5	10.15
Jacksonville,Fla. M8	10.46
Johnstown,Pa. B2	9.90
Joliet,Ill. A7	9.90
KansasCity,Mo. S5	10.15
Kokomo,Ind C16	10.00
LosAngeles B3	10.70
Minnequa,Colo. C10	10.15
Pittsburg,Calif. C11	10.70
S.Chicago,Ill. R2	9.90
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	10.00
Sterling,Ill.(1) N15	9.90

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	.184**
Aliquippa,Pa. J5	.185‡
Atlanta A11	.190*
Bartonville,Ill. K4	.193
Crawfordsville,Ind. M8	.190
Donora,Pa. A7	.184†
Duluth A7	.184†
Fairfield,Ala. T2	.184†
Houston,Tex. S5	.189**
Jacksonville,Fla. M8	.195
Johnstown,Pa. B2	.188*
Joliet,Ill. A7	.184†
KansasCity,Mo. S5	.189**
Kokomo,Ind. C16	.186†
Minnequa,Colo. C10	.189**
Monessen,Pa. P7	.191*
Pittsburg,Calif. C11	.204†
Rankin,Pa. A7	.184†
S.Chicago,Ill. R2	.184**
S.SanFrancisco C10	.207**
SparrowsPoint,Md. B2	190*
Sterling,Ill(1) N15	.188*

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	.176**
Aliq'ppa,Pa. 9-14½ga.J5	184‡
Atlanta A11	.182*
Bartonville,Ill. K4	.187
Crawfordsville,Ind. M8	.182
Donora,Pa. A7	.176†
Duluth A7	.176†
Fairfield,Ala. T2	.176†
Houston,Tex. S5	.181**
Jacksonville,Fla. M8	.187
Johnstown,Pa.(43) B2	.180*
Joliet,Ill. A7	.176†
KansasCity,Mo. S5	.181**
Kokomo,Ind. C16	.178†
Minnequa,Colo. C10	.181**
Monessen,Pa. 9 ga. P7	185*
Pittsburg,Calif. C11	.199†
Rankin,Pa. A7	.176†
S.Chicago,Ill. R2	.176**
Sterling,Ill.(1) N15	.180*

WIRE (16 gage)	An'ld Stone	Galv. Stone
Ala.City,Ala.R2	15.70	17.25**
Bartonville K4	.16.10	18.05
Buffalo W12	.16.10	....
Cleveland A7	.15.70	17.25†
Crawf'dsville M8	15.80	17.75
Fostoria,O. S1	.16.20	17.75†
Houston S5	.15.95	17.50**
Jacksonville M8	.16.05	18.00
Johnstown B2	.16.10	18.05*
Kan.City,Mo.S5	15.95	17.50**
Kokomo C16	.15.80	17.35†
Minnequa C10	.16.05	17.75**
P'lm'r,Mass.W2	16.10	17.65*
Pitts.,Calif. C11	16.05	17.60†
SparrowsPt. B2	.16.20	18.15*
Sterling(1) N15	16.10	18.05*
Waukegan A7	.15.70	17.25†
Worcester A7	.16.00	....

WIRE, Merchant Quality (6 to 8 gage)

	An'ld	Galv.
Ala.City,Ala. R2	7.95	8.35**
Aliquippa J5	.8.10	8.625‡
Atlanta A11	.8.05	8.65*
Bartonville(48) K4	8.20	8.80
Buffalo W12	.8.10	8.50†
Cleveland A7	.7.95	....
Crawfordsville M8	.8.05	8.65
Donora,Pa. A7	.7.95	8.35†
Duluth A7	.7.95	8.35†
Fairfield T2	.7.95	8.35†
Houston(48) S5	8.20	8.60**
Jacks-ville,Fla. M8	8.30	8.90
Johnstown B2(48)	7.95	8.55*
Joliet,Ill. A7	.7.95	8.35†
Kans.City(48) S5	8.20	8.60**
Kokomo C16	.8.05	8.45†
LosAngeles B3	.8.90	9.50*
Minnequa, C10	.8.20	8.60**
Monessen P7 (48)	8.10	8.70*
Palmer,Mass. W12	8.40	8.80†
Pitts.,Calif. C11	.8.90	9.30†
Portsmouth,O. P12	7.95	....
Rankin,Pa. A7	.7.95	8.35†
S.Chicago R2	.7.95	8.35**
S.SanFran. C10	8.90	9.30**
Spar'wsPt. B2(48)	8.05	8.65*
Sterling(1)(48)N15	7.95	8.55*
Struth'rs,O.(48)Y1	7.95	8.45‡
Worcester,Mass.A7	8.25	8.65†

Based on zinc price of: *13.50c. †5c. ‡10c. §Less than 10c. ††13. **Subject to zinc equalization extras.

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	.190
Atlanta A11	.192
Bartonville,Ill. K4	.197
Crawfordsville,Ind. M8	.192
Donora,Pa. A7	.190
Duluth A7	.190
Fairfield,Ala. T2	.190
Houston S5	.195
Jacksonville,Fla. M8	.197
Joliet,Ill. A7	.190
KansasCity,Mo. S5	.195
Kokomo,Ind. C16	.192
Minnequa,Colo. C10	.195
Pitts.,Calif. C11	.214
S.Chicago,Ill. R2	.190
S.SanFrancisco C10	.214
Sterling,Ill. N15	.190
SparrowsPoint.,Md. B2	.192
Tonawanda,N.Y. B12	.169
Williamsport,Pa. S19	.175

FENCE POSTS

ChicagoHts.,Ill. C2, I-2	.167
Duluth A7	.167
Franklin,Pa. F5	.167
Huntington,W. Va. W7	.169
Johnstown,Pa. B2	.167
Marion,O. P11	.167
Minnequa,Colo. C10	.172
Sterling,Ill. N15	.167
Tonawanda,N.Y. B12	.169
Williamsport,Pa. S19	.175

FASTENERS

(Base discounts, full container quantity, per cent off list, f.o.b. mill)

BOLTS

Carriage, Machine Bolts

Full Size Body (cut thread)
- ⅛ in. and smaller:
  - 6 in. and shorter.. 55
  - Longer than 6 in. .. 46.5
- ⅞ in. thru 1 in.:
  - 6 in. and shorter .. 46.5
  - Longer than 6 in. .. 44
- 1¼ in. and larger: All lengths 44

Undersized Body (rolled thread)
- ⅛ in. and smaller: 6 in. and shorter .. 55

Carriage, Machine, Lag Bolts

Hot Galvanized:
- ⅛ in. and smaller:
  - 6 in. and shorter .. 35
  - Longer than 6 in. .. 23
- ⅞ in. thru 1 in.:
  - 6 in. and shorter .. 20
  - Longer than 6 in. .. 20
- 1¼ in. and larger: All lengths 20

Lag Bolts

All diameters:
- 6 in. and shorter 55
- Longer than 6 in. .. 47

Plow and Tap Bolts

⅛ in. and smaller by 6 in. and shorter 54

Larger than ⅛ in. or longer than 6 in. 47

Blank Bolts 47

Step, Elevator, Tire Bolts 54

NUTS

Reg. & Heavy Square Nuts: All sizes 59

Square Nuts, Reg. & Heavy, Hot Galvanized: All sizes 45

Hex Nuts, Reg. & Heavy, Hot Pressed:
- ¾ in. and smaller . 63
- ⅞ in. to 1 in. incl. 59.5
- 1¼ in. to 1½ in., incl. 64
- 1⅝ in. and larger .. 58

Hex Nuts, Reg. & Heavy, Cold Punched:
- ¾ in. and smaller.. 63
- ⅞ in. to 1½ in., incl. 59.5
- 1⅝ in. and larger . 58

Hex Nuts, All Types, Hot Galvanized:
- ¾ in. and smaller.. 50
- ⅞ in. to 1 in., incl. 46
- 1¼ in. to 1½ in., incl. 51

Hex Nuts, Semifinished, Reg. & Heavy (Incl. Slotted):
- ¾ in. and smaller.. 63
- ⅞ in. to 1½ in., incl. 59.5
- 1⅝ in. and larger .. 58

Hex Nuts, Finished (Incl. Slotted and Castellated):
- 1 in. and smaller .. 65
- 1⅛ in. to 1½ in., incl. 62
- 1⅝ in. and larger.. 58

CAP AND SET SCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Cap Screws, Coarse or Fine Thread

Bright:

6 in. and shorter:
- ⅝ in. and smaller.. 47
- ¾, ⅞ and 1 in. diam. 31

Longer than 6 in.:
- ⅝ in. and smaller.. 18.5
- ¾, ⅞ and 1 in. diam. 5.5

High Carbon, Heat Treated:

6 in. and shorter:
- ⅝ in. and smaller.. 34
- ¾, ⅞ and 1 in. diam. 13

Longer than 6 in.:
- ⅝ in. and smaller. +1
- ¾, ⅞ and 1 in. diam. ..... +19

Fillister Head, Coarse Thread: Listed Sizes ..... +31

Flat Head, Coarse Thread. ¼ in. and smaller by 6 in. and shorter.. +57

Set Screws, Square Head, Cup Point, Coarse Thread:

Through 1 in. diam.:
- 6 in. and shorter .. 11
- Longer than 6 in. .. +10

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 10.85
- 1/16-in. under List less 26.5%

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	23.56	22.84
1¼	13	....	27.92	22.68
1½	13	26.34	30.86	25.08
1¾	13	31.12	36.45	29.64
2	13	34.88	40.85	33.21
2¼	13	39.29	46.01	37.42
2½	12	42.64	49.94	40.61
2¾	12	46.98	55.01	44.73
3	12	50.86	59.57	48.44
3	12	54.24	63.53	51.66

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb Under
RAILS				
Bessemer,Pa. U5	5.075	4.975	5.025	6.00
Ensley,Ala. T2	5.075	4.975	....	6.00
Fairfield,Ala. T2	....	....	....	6.00
Gary,Ind. U5	5.075	4.975	5.025	...
Huntington,W. Va. W7	....	....	....	6.15
IndianaHarbor,Ind. I-2	5.075	4.975	5.025	...
Johnstown,Pa. B2	....	....	....(16)	6.00
Lackawanna,N.Y. B2	5.075	4.975	....(16)	6.00
Minnequa,Colo. C10	5.075	4.975	....	6.50
Steelton,Pa. B2	5.075	4.975	....	...
Williamsport,Pa. S19	....	....	....	6.15

TIE PLATES

Fairfield,Ala. T2	6.025
Gary,Ind. U5	6.025
Ind.Harbor,Ind. I-2	6.025
Lackawanna,N.Y. B2	6.025
Minnequa,Colo. C10	6.025
Seattle B3	6.175
Steelton,Pa. B2	6.025
Torrance,Calif. C11	6.175

JOINT BARS

Bessemer,Pa. U5	6.35
Fairfield,Ala. T2	6.35
Ind.Harbor,Ind. I-2	6.35
Joliet,Ill. U5	6.35
Lackawanna,N.Y. B2	6.35
Minnequa,Colo. C10	6.35
Steelton, Pa. B2	6.35

AXLES

Ind.Harbor,Ind. S13	8.10
Johnstown,Pa. B2	8.10

TRACK BOLTS, Untreated

Cleveland R2	13.10
Lebanon,Pa. B2	13.10
Minnequa,Colo. C10	13.10
Pittsburgh P14	13.10
Seattle B3	13.60

SCREW SPIKES

Cleveland R2	12.85
Pittsburgh P14	12.85

STANDARD TRACK SPIKES

Fairfield,Ala. T2	8.775
Ind.Harbor,Ind. I-2, Y1	8.775
KansasCity,Mo. S5	8.775
Lebanon,Pa. B2	8.775
Minnequa, Colo. C10	8.775
Pittsburgh J5	8.775
Seattle B3	9.275
S.Chicago,Ill. R2	8.775
Struthers,O. Y1	8.775
Youngstown R2	8.775

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1½ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in.; 6.23c; 1 15/16 to 3 in.; inclusive, 6.60c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.85c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) Plus 1c per 100 lb.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Delivered in mill zone, 5.085c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝-in.; 7.30c, for widths ⅝-in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 24" and narrower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 8.35c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.085c.
(43) 9-14½ Ga.
(48) 6-7 Ga.
(49) 3½-in. and smaller rounds; 8.65c, over 3½-in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.45		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+2	+20	4.5	+14.25	7	+11.75	8.5	+10.25	8.5	+10.25	8.25	+10.5	10.75	+8
Ambridge, Pa. N2	+2	....	4.5	....	7	....	8.5	....	8.5	....	8.25	....	10.75	....
Lorain, O. N3	+2	+20	4.5	+14.25	7	+11.75	8.5	+10.25	8.5	+10.25	8.25	+10.5	10.75	+8
Youngstown Y1	0.5	+17.5	4.5	+14.25	7	+11.75	8.5	+10.25	8.5	+10.25	8.25	+10.5	10.75	+8

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+2	+20	4.5	+14.25	7	+11.75	8.5	+10.25	8.5	+10.25	8.25	+10.5	10.75	+8

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	12.5	+6.75	15.5	+2.75	18	0.75	30.5	2.5
Alton, Ill. L1	....	....	....	....	....	....	10.5	+3.75	13.5	+4.75	16	+1.25	13.5	9.5
Benwood, W. Va. W10	10	+20.5	+9.25	+27.75	+9.75	+37.25	12.5	+6.75	15.5	+2.75	18	0.75	30.5	2.5
Butler, Pa. F6	10	+20.5	9.5	+27	+8.5	+36	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	12.5	+6.75	15.5	+2.75	18	0.75	30.5	2.5
Fairless, Pa. N3	....	....	....	....	....	....	10.5	+8.75	13.5	+4.75	16	+1.25	13.5	9.5
Fontana, Calif. K1	....	....	....	....	....	....	0	+19.25	3	+15.25	5.5	+11.75	8	+10
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	11.5	+7.75	14.5	+3.75	17	+0.25	19.5	1.5
Lorain, O. N3	....	....	....	....	....	....	12.5	+6.75	15.5	+2.75	18	0.75	30.5	2.5
Sharon, Pa. S4	11	+19.5	1.5	+26	+7.5	+35	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	12.5	+6.75	15.5	+2.75	18	0.75	30.5	2.5
Sparrows Pt., Md. B2	9	+21.5	0.5	+28	+9.5	+37	10.5	+8.75	13.5	+4.75	16	+1.25	13.5	9.5
Wheatland, Pa. W9	11	+19.5	1.5	+26	+7.5	+35	12.5	+6.75	15.5	+2.75	18	0.75	30.5	2.5
Youngstown R2, Y1	....	....	....	....	....	....	12.5	+6.75	15.5	+2.75	18	0.75	30.5	2.5

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	21	3.5	21.5	4	23	4.75	23	4.75	....	....	....	....
Alton, Ill. L1	19	1.5	19.5	2	21	2.75	21	2.75	....	....	....	....
Benwood, W. Va. W10	21	3.5	21.5	4	23	4.75	23	4.75	13.5	+9.75	18.5	+8.25
Etna, Pa. N2	21	3.5	21.5	4	23	4.75	23	4.75	18.5	+5.25	18.5	+8.25
Fairless, Pa. N3	19	1.5	19.5	2	21	2.75	21	2.75	11.5	+7.25	11.5	+7.25
Fontana, Calif. K1	8.5	+9	9	+8.5	10.5	+7.75	10.5	+7.75	1	+17.75	1	+17.75
Indiana Harbor, Ind. Y1	20	2.5	20.5	3	22	3.75	22	3.75	13.5	+6.25	13.5	+6.25
Lorain, O. N3	21	3.5	21.5	4	23	4.75	23	4.75	....	....	....	....
Sharon, Pa. M6	21	3.5	21.5	4	23	4.75	23	4.75	....	....	....	....
Sparrows Pt., Md. B2	19	1.5	19.5	2	21	2.75	21	2.75	11	+7.25	11	+7.25
Wheatland, Pa. W9	21	3.5	21.5	4	23	4.75	23	4.75	13.5	+5.25	13.5	+5.25
Youngstown R2, Y1	21	3.5	21.5	4	23	4.75	23	4.75	13.5	+5.25	13.5	+5.25

*Galvanized pipe discounts based on current price of zinc (13.50c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling Ingot	Rerolling Slabs	Forging Billets	H.R. Strip	Wire Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	21.25	26.00	....	34.50	....	....	....	46.75	43.25
202	22.75	29.00	35.00	37.50	39.25	41.25	43.25	47.25	47.25
301	22.25	27.00	35.75	35.75	40.25	42.50	44.50	49.25	45.75
302	24.25	30.25	36.50	39.00	41.00	43.25	45.50	50.00	50.00
302B	24.50	31.50	39.25	44.00	43.25	45.50	47.50	54.75	54.75
303	....	30.75	39.50	....	44.00	46.25	48.00	54.50	54.50
304	26.00	32.00	39.00	42.50	43.75	46.00	48.75	53.25	53.25
304L	....	....	46.50	49.50	51.25	53.50	56.25	60.75	60.75
305	27.50	33.25	40.75	45.75	43.75	46.00	49.25	56.50	56.50
308	29.50	36.75	45.50	48.25	50.75	53.50	56.00	60.50	60.50
309	35.25	47.50	58.50	62.00	61.25	64.50	68.25	77.50	77.50
310	47.75	58.25	75.00	81.00	83.25	87.50	89.25	93.00	93.00
314	....	....	....	....	83.25	....	80.25	....	....
316	35.25	47.50	59.75	66.50	66.75	70.25	73.75	78.25	78.25
316L	....	....	67.25	73.00	74.25	77.25	81.25	85.75	85.75
317	46.25	57.75	73.75	84.75	85.00	87.25	90.00	97.00	97.00
321	31.00	35.50	45.25	51.50	50.50	53.25	57.50	63.00	63.00
18-8 CbTa	35.50	44.75	53.50	61.00	59.25	62.25	67.00	76.25	76.25
403	....	....	30.75	....	34.50	36.25	38.75	46.50	46.50
405	18.75	24.50	28.50	24.50	32.50	34.00	36.00	45.00	45.00
410	16.00	20.75	27.25	29.75	31.00	32.50	33.75	38.75	38.75
416	....	....	27.75	....	31.50	33.00	34.75	46.50	46.50
420	....	32.25	32.00	40.25	37.75	39.75	42.50	59.50	59.50
430	16.25	21.00	27.75	30.75	31.50	33.00	34.50	39.25	39.25
430F	....	....	28.25	....	32.00	33.50	35.25	49.75	49.75
431	....	27.75	36.25	....	40.25	42.50	44.25	53.75	53.75
446	....	....	37.75	56.75	42.50	44.75	46.00	67.25	67.25

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Div., H. K. Porter Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U.S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Elwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McInnes Steel Co.; McLouth Steel Corp.; Metal Forming Corp.; National-Standard Co.; National Tube Div., U.S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Plates: 5%	Plates: Carbon Base 10%	Plates: Carbon Base 15%	Plates: Carbon Base 20%	Sheets: Carbon Base 20%
Stainless					
302	....	....	....	....	33.25
304	33.15	36.20	40.30	44.50	35.25
304-L	35.40	38.80	43.15	47.65	....
316	38.35	41.60	45.90	50.15	52.25
316-L	43.55	47.60	52.70	57.85	....
316-CB	43.85	48.10	53.40	58.75	....
321	34.90	37.95	42.10	46.40	42.00
347	37.05	41.25	46.45	51.70	51.00
405	27.55	29.20	33.15	37.05	....
410	27.00	28.70	32.65	36.55	....
430	27.00	28.70	32.65	36.55	....
Inconel	47.28	57.90	68.50	79.20	....
Nickel	40.00	50.30	60.65	71.05	....
Nickel, Low Carbon	40.30	50.95	61.65	72.50	....
Monel	41.70	51.90	62.15	72.40	....
Copper*	....	....	....	....	46.00

	Strip, Carbon Base—Cold Rolled—10%	Strip, Carbon Base—Cold Rolled—Both Sides
Copper*	34.40	40.65

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.290	Cr Hot Work	0.45-0.495
Extra Carbon	0.345	W-Cr Hot Work	0.043-0.475
Special Carbon	0.41-0.45	V-Cr Hot Work	0.460
Oil Hardening	0.450	Hi-Carbon-Cr	0.830

Grade by Analysis (%) W	Cr	V	Co	Mo		$ per lb
20.25	4.25	1.6	12.25	...	.....	4.170
18.25	4.25	1	4.75	...	.....	2.385
18	4	2	9	...	.....	2.7575
18	4	2	....	...	.....	1.845
18	4	1	....	...	.....	1.650
9	3.5	..	....	...	.....	1.275
13.5	4	3	....	...	.....	1.945
13.75	3.75	2	5	...	.....	2.325
6.4	4.5	1.9	....	5	.....	1.185
6	4	3	....	6	.....	1.430
1.5	4	1	....	8.5	.....	1.040

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
AlabamaCity,Ala. R2	58.50	59.00	....	....
Birmingham R2	58.50	59.00‡	....	....
Birmingham U6	....	59.00‡	63.00	....
Woodward,Ala. W15	58.50	59.00‡	63.00	....
Cincinnati, deld.	....	66.70	....	....
Buffalo District				
Buffalo H1, R2	62.50	63.00	63.50	64.00
Tonawanda,N.Y. W12	62.50	63.00	63.50	64.00
N.Tonawanda,N.Y. T9	....	63.00	63.50	64.00
Boston, deld.	73.79	74.29	74.79	....
Rochester,N.Y., deld.	65.52	66.02	66.52	....
Syracuse,N.Y., deld.	66.62	67.12	67.62	....
Chicago District				
Chicago I-3	62.50	63.00	63.00	63.50
Gary,Ind. U5	62.50	....	63.00	....
S.Chicago,Ill. R2	62.50	....	63.00	....
S.Chicago,Ill. Y1	62.50	63.00	63.00	....
S.Chicago,Ill. U5	62.50	....	63.00	63.50
S.Chicago,Ill. W14	62.50	....	63.00	63.50
Milwaukee, deld.	64.96	65.46	65.46	65.96
Muskegon,Mich., deld.	....	76.83	76.83	....
Cleveland District				
Cleveland R2, A7	62.50	63.00	63.00	63.50
Akron,O., deld.	65.25	65.75	65.75	66.25
Mid-Atlantic District				
Birdsboro,Pa. B10	64.50	65.00	65.50	66.00
Chester,Pa. P4	64.50	65.00	65.50	....
Philadelphia, deld.	66.26	66.76	67.26	....
Swedeland,Pa. A3	64.50	65.00	65.50	66.00
New York, deld	....	71.20	71.70	....
Newark,N.J., deld.	68.52	69.02	69.52	70.02
Philadelphia, deld.	66.38	66.88	67.38	67.88
Troy,N.Y. R2	64.50	65.00	65.50	66.00
Pittsburgh District				
NevilleIsland,Pa. P6	62.50	63.00	63.00	63.50
Pittsburgh (N&S sides), Aliquippa, deld.	....	64.45	64.45	64.98
McKeesRocks,Pa. deld.	....	64.10	64.10	64.63
Lawrenceville, Homestead, Wilmerding, Monaca,Pa., deld.	....	64.76	64.76	65.29
Verona, Trafford,Pa., deld	64.79	65.32	65.32	65.85
Brackenridge,Pa., deld.	65.10	65.60	65.60	66.13
Bessemer,Pa. U5	62.50	....	63.00	63.50
Clairton,Rankin,S.Duquesne,Pa. U5	62.50	....	....	....
Midland,Pa. C18	62.50	....	....	....

	Basic	No. 2 Foundry	Malleable	Bessemer
Youngstown District				
Hubbard,O. Y1	....	....	63.00	....
Sharpsville,Pa. S6	62.50	....	63.00	63.50
Youngstown Y1	....	....	63.00	63.50
Mansfield,O., deld.	67.40	....	67.90	68.40
Duluth I-3	62.50	63.00	63.00	63.50
Erie,Pa. I-3	62.50	63.00	63.00	63.50
Everett,Mass. E1	64.50	65.00	65.50	....
Fontana,Calif. K1	70.00	70.50	....	....
Geneva,Utah C11	62.50	63.00	....	....
GraniteCity,Ill. G4	64.40	64.90	65.40	....
Ironton,Utah C11	62.50	63.00	....	....
LoneStar,Tex. L6	58.50*	59.00†	....	....
Minnequa,Colo. C10	64.50	65.00	65.50	....
Rockwood,Tenn. T3	....	59.00‡	63.00	....
Toledo,O. I-3	62.50	63.00	63.00	63.50
Cincinnati, deld.	68.26	68.76	....	....

*Phos. 0.51-0.75%; Phos. 0.31-0.50%, $59.50.
†Phos. 0.51-0.75%; Phos. 0.31-0.50%, $60.
‡Phos. 0.70-0.90%; intermediate (Phos. 0.31-0.69%), $60.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.05% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.25 for each 0.5% Si; 75 cents for each 0.50% Mn over 1%)

Jackson,O. I-3, J1	71.50
Buffalo H1	72.75

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	*$105.50*
NiagaraFalls,N.Y. P15	*105.50*
Keokuk,Iowa, Open-hearth & Fdry, freight allowed K2	110.00
Keokuk, O.H. & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2	113.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$76.50
Rockwood,Tenn. T3 (Phos. 0.035% max)	76.50
Troy,N.Y. R2 (Phos. 0.035% max)	70.50
Philadelphia, deld.	78.26
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	67.50
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	67.50
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	67.50
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	67.50

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: St. Paul, 25 cents; Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, San Francisco, Spokane, 10 cents; Atlanta, Houston, Seattle no charge.

	SHEETS				STRIP	BARS				Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Merchant Qual.	H.R. Spec. Qual.	C.F. Rds.‡	H.R. Alloy 4140††[3]		Carbon	Floor
Atlanta	8.07‖	9.27‖	9.83‖	....	8.16	8.30	...	10.14	....	8.44	8.40	10.22
Baltimore	7.79	8.99	9.12	....	8.27	8.34	8.87	9.09[1]	15.69	8.57	8.12	10.81
Birmingham	7.68‖	8.88‖	8.85‖	....	7.78	7.91	8.44	10.04	....	8.05	8.01	10.04
Boston	8.70	9.73	11.02	....	8.79	8.88	9.43	10.71	14.46	8.90	8.98	10.39
Buffalo	7.75	8.90	10.72	....	8.00	8.00	8.70	8.70	14.30	8.25	8.25	9.80
Chattanooga	7.90‖	9.10‖	9.10‖	....	8.00	8.13	8.66	9.96	....	8.27	8.23	9.98
Chicago	7.70	8.90	9.70	....	7.78	7.91	8.44	8.35	13.95	8.05	8.01	9.26
Cincinnati	7.82	8.89	9.75	....	8.06	8.19	8.72	8.82	14.23	8.55	8.34	9.53
Cleveland	7.68	8.88	9.60	....	7.88	7.99	8.52	8.60	14.03	8.38	8.21	9.46
Denver	9.55	11.09	12.41	....	9.70	9.75	...	10.54	18.89	9.60	9.50	11.15
Detroit	7.91	9.13	10.02	....	8.10	8.18	8.71	8.68	14.19	8.55	8.33	9.49
Erie, Pa.	7.75	8.88	9.60[10]	....	7.90	8.00	8.65	8.70[10]	....	8.35	8.20	9.50
Houston	8.70	9.65	10.99	....	8.80	8.95	9.50	10.55	15.00	8.90	8.60	10.10
Jackson, Miss.	8.00‖	9.20‖	9.22‖	....	8.10	8.23	8.76	10.14	....	8.37	8.33	10.08
Los Angeles	8.90	10.65	11.65	....	9.10	8.80	9.50	11.70	15.25	8.95	9.35	11.50
Milwaukee	7.82	9.02	9.82	....	7.90	8.03	8.56	8.57	14.07	8.24	8.13	9.38
Moline, Ill.	8.05	9.25	10.05	....	8.13	8.26	...	8.70	....	7.78	8.36	...
New York	8.35	9.53	10.23	57.73	8.81	8.83	9.38	10.61	14.37	8.74	8.78	10.05
Norfolk, Va.	7.85	...	...	....	8.30	8.35	...	10.80	....	8.60	8.10	9.60
Philadelphia	7.89	9.08	10.12	....	8.58	8.37	8.90	9.12	14.15	8.38	8.28	9.37
Pittsburgh	7.68	8.88	10.05	50.00	7.88	7.91	8.44	8.60	13.95	8.05	8.01	9.26
Portland, Oreg.	8.90	9.65	11.40	....	9.05	8.95	...	13.55	14.60	8.90	8.70	11.60
Richmond, Va.	8.05	...	10.09	....	8.45	8.70	9.20	10.00	....	8.80	8.35	9.70
St. Louis	8.02	9.21	10.03	....	8.11	8.25	8.78	8.93	14.28	8.48	8.34	9.59
St. Paul	8.29	9.49	10.31	....	8.39	8.52	...	9.21	....	8.75	8.71	9.87
San Francisco	8.75	10.30	10.80	....	8.95	8.80	9.35	12.30	15.25	8.85	8.85	11.15
Seattle	9.35	10.45	11.55	....	9.50	9.30	9.85	13.15	15.55	9.15	9.05	11.25
Spokane, Wash.	9.35	10.50	11.55	....	9.50	9.30	9.85	13.15	16.30	9.15	9.05	11.25
Washington	8.37	10.57	...	....	9.06	8.92	...	9.67	....	9.15	8.70	10.14

*Prices do not include gage extras; †prices include gage and coating extras (based on 12.50c zinc at Los Angeles and 13.50c at other points), except in Birmingham (coating extra excluded); ‡includes 35-cent bar quality extras; **¼-in. and heavier; ††as annealed; ‖2 in. and under.

Base quantities, 2000 to 4999 lb except as noted; cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York and Boston, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; [3]—400 to 999 lb; [1]—1000 to 1999 lb; [2]—2000 to 3999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Parber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $128; Salina, Pa., $133; Niles, O., $138; Cutler, Utah, $148.

Super-Duty: Ironton, O., Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Pa., New Savage, Md., St. Louis, $165; Stevens Pottery, Ga., $175.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, O., Hawstone, Pa., $140; Warren, Niles, Windham, O., Hays, Latrobe, Morrisville, Pa., $145; E. Chicago, Ind., Joliet, Rockdale, Ill., $150; Lehigh, Utah, $165; Los Angeles, $170.

Super-Duty: Hays, Sproul, Hawstone, Pa., Niles, Warren, Windham, O., Leslie, Md., Athens, Tex., $157; Morrisville, Latrobe, Pa., $160; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $145; Woodbridge, N. J., $128; Philadelphia, $130.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, O., $98; Clearfield, Pa., Portsmouth, O., $98.

High-Alumina Brick (per 1000)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $220; Danville, Ill., $223; Philadelphia, Clearfield, Pa., $230.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $275; Danville, Ill., $278; Philadelphia, Clearfield, Pa., $285.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $315; Danville, Ill., $318; Philadelphia, Clearfield, Pa., $325.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $177; Clearfield, Pa., $189.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $292; Clearfield, Pa., $311.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $221; Clearfield, Pa., $236.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, O., Gibsonburg, Narlo, O., $16; Thornton, McCook, Ill., $16.35; Dolly Siding, Bonne Terre, Mo., $15.

Magnesite (per net ton)

Domestic, dead-burned, bulk ¼-in. grains with fines: Chewelah, Wash., Luning, Nev. $43; ⅝-in. grains with fines: Baltimore, $69.40.

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $38-39; 70%, $35-36; 60%, $31-32. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $34; Mexican, $26.50.

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

Sponge iron:	Cents
Swedish, c.i.f. Camden, N.J., e.l. in bags	8.50
Domestic:	
F.o.b., Johnstown, Pa., Ningara Falls, N. Y., in bags	9.50
F.o.b. Riverton, N.J., in bags	8.50
Canadian, f.o.b. shipping point	9.50
Electrolytic iron:	
Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in.	26.00
Annealed, 99.5% Fe.	36.50
Unannealed (99+ % Fe)	34.00
Unannealed (99+ % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)	29.00
Carbonyl Iron:	
98.1-99.9%, 3 to 20 microns, depending on grade, 86.00-275.00, in standard 200-lb containers; all minus 200 mesh.	
Aluminum:	
Atomized, 500 lb. drum, frght allowed	
Carlots	36.20
Ton lots	38.20
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	36.80-46.80†
Bronze, 5000-lb lots	56.20-60.00†
Copper:	
Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese:	
Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	*$1.05*
Nickel-Silver, 5000-lb lots	55.10-58.40†
Phosphor-Copper, 5000-lb lots	66.00
Copper (atomized) 5000-lb lots	48.50-56.00‡
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	$1.05
Stainless Steel, 316	$1.40
Tin	14.50*
Zinc, 5000-lb lots	19.75-23.00‡
Tungsten: Dollars	
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	4.20
Less than 1000 lb.	4.35
Chromium, electrolytic 99.8% Cr min. metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni. **64% Cu, 18% Zn, 18% Ni.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches Diam.	Length	Per 100 lb
2	24	$57.75
2½	30	37.25
3	40	35.25
4	40	33.25
5¼	40	33.00
6	60	30.00
7	60	26.75
8, 9, 10	60	26.50
12	72	25.50
14	60	25.50
16	72	24.50
17	60	25.50
18	72	24.50
20	72	24.00
24	84	24.75

CARBON

8	60	13.30
10	60	13.00
12	60	12.95
14	60	12.85
14	72	11.95
17	60	11.85
17	72	11.40
20	84	11.40
20	90	11.00
24	72, 84	11.25
24	96	10.95
30	84	11.05
40, 35	110	10.70
40	100	10.70

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$7.40	$7.40	$7.40	$7.65
Bar Size Angles	7.11	7.11	7.11	7.26
Structural Angles	7.40	7.40	7.40	7.70
I-Beams	7.75	7.75	7.75	8.15
Plates	9.50	9.50	9.50	10.00
Sheets, H.R.	8.55	8.55	8.55	8.85
Sheets, C.R. (drawing quality)	8.95	8.95	8.95	9.35
Furring Channels, C.R., 1000 ft, ⅞ x 0.30 lb per ft	27.02	27.02	27.02	27.49
Barbed Wire (†)	6.61	6.61	6.61	6.96
Merchant Bars	7.15	7.15	7.15	7.50
Hot-Rolled Bands	7.25	7.25	7.25	7.65
Wire Rods, Thomas Commercial No. 5	6.38	6.38	6.38	6.78
Wire Rods, O-H Cold Heading Quality No. 5	6.72	6.72	6.72	7.12
Bright Common Wire Nails (‡)	7.90	7.90	7.90	8.02
Oil Country Pipe: Mills withdrawn for remainder of the year.				

†Per 82-lb. net, reel. ‡Per 100-lb kegs, 20d nails and heavier.

Ores

Lake Superior Iron Ore

(Prices effective for the 1956 shipping season, gross tons, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$11.25
Old range nonbessemer	11.10
Mesabi bessemer	11.00
Mesabi nonbessemer	10.85
Open-hearth lump	12.10
High phos.	10.85

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Dec. 1, 1955, and increases or decreases after such date are for seller's account.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

Foundry and basic 52-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	25.00
N. African hematite (spot)	nom. 24.00-25.00
Brazilian iron ore, 68-69%	33.00-34.00

Tungsten Ore

Net ton unit, before duty

Foreign, wolframite, good commercial quality	$28.50-29.00
Domestic, concentrates, mine	55.00

Manganese Ore

Mn 46-48%, Indian (export tax included), $1.60-1.70 per long ton unit, c.i.f. U.S. ports, duty for buyer's account; other than Indian, $1.45-1.50; contracts by negotiation.

Chrome Ore

Gross ton f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$54.00-57.00
48% 2.8:1	51.00-54.00
48% no ratio	43.00-45.00

South African Transvaal

48% no ratio	$37.50-39.00
44% no ratio	26.00-27.00

Turkish

48% 3:1	$60.00-63.00

Domestic

Rail nearest seller

18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked	$1.15

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

55-60%	$3.35-3.80
60-65%	3.80-3.90

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-15.50
Connellsville, foundry	17.50-18.50

Oven Foundry Coke

Birmingham, ovens	$27.60
Cincinnati, deld.	32.53
Buffalo, ovens	29.50
Camden, N.J., ovens	28.50
Detroit, ovens	29.50
Pontiac, deld.	31.15
Saginaw, deld.	32.73
Erie, Pa., ovens	*30.50*
Everett, Mass., ovens	
New England, deld.	30.55*
Indianapolis, ovens	*29.75*
Ironton, O., ovens	28.00
Cincinnati, deld.	28.25
Kearny, N.J., ovens	29.00
Lone Star, Tex., ovens	25.50
Milwaukee, ovens	*30.50*
Painesville, O., ovens	*30.50*
Cleveland, deld.	*32.55*
Philadelphia, ovens	28.50
St. Louis, ovens	*31.50*
Neville Island (Pittsburgh), Pa., ovens	28.25
St. Paul, ovens	*29.75*
Chicago, deld.	*33.14*
Swedeland, Pa., ovens	28.50
Terre Haute, Ind., ovens	*29.75*

*Or within $4.55 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg.	32.00-34.00
Industrial xylene	32.00-35.00

Per ton, bulk, ovens

Ammonium sulfate	$32.00

Cents per pound, producing point

Phenol: Grade 1, 15.00; Grade 2-3, 14.50; Grade 4, 16.50; Grade 5, 15.25.

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton; $255, Johnstown, Duquesne, Sheridan, Pa., Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%). Lump $263 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.30% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed, carload 26.8c, ton lot 28.4c, less ton 29.6c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min Fe 2% max, Si 1% max, C 0.2% max). Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lots 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, 33c; 2000 lb to min carload, 35c; 500 lb to 1999 lb, 37c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 13.8c per lb of alloy. Packed, c.l. 15c, ton 15.45c, less ton 16.45c, f.o.b. Alloy, W. Va., Ashtabula, O., Marietta, O., Sheffield, Ala., Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton $1.37 f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $200 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $225 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk 27.75c per lb of contained Cr; c.l. packed 29.3c, ton lot 31.05c; less ton 32.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-71%). Contract, carload, lump, bulk, C 0.025% max (Simplex) 34.75c per lb contained Cr, 0.02% max 41.5c, 0.03% max 41c, 0.06% max 39.5c, 0.1% max 39c, 0.15% max 38.75c, 0.2% max 38.5c, 0.5% max 38.25c, 1.0% max 37.5c, 1.5% max 37.35c, 2.0% max 37.25c. Ton lot, add 3.4c, less ton add 5.1c. Carload packed add 1.75c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 29.05c per lb contained Cr. Packed, c.l. 30.65c, ton 32.45c, less ton 33.95c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8 M x D, 20.85c, per lb of alloy, ton lot 22.10c; less ton lot 23.3c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome-Silicon: (Cr 39-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 41.35c per lb of contained Cr; 1" x down, bulk 42.35c. Delivered.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed 2" x D plate (about ⅛" thick) $1.29 per lb, ton lots $1.31, less ton lots $1.33. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1, $1.05 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si. Packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 13.9c per lb of contained Si. Packed c.l. 16.4c, ton lot 17.55c, less ton 19.5c, f.o.b. Alloy, W. Va., Ashtabula, Marietta, O., Sheffield, Ala., and Portland, Oreg. Spot, add 0.45c.

Low Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.55c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.25c per pound contained silicon. Packed, c.l. 17.25c, ton lot, 19.05c; less ton 20.4c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.4c per lb of contained Si. Packed, c.l. 18.30c, ton lot 19.95c, less ton 21.2c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 19.5c per lb of contained Si. Packed, c.l. 21.15c, ton lot 22.55c, less ton 23.6c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 98% Si, 0.75% max Fe, 0.07% max Ca). C.l. lump, bulk 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Deduct 0.5c for max 2% Fe grade analyzing min 96.5% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy, ton lot, packed, 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zircenium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Bortam: (B 1.5%-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3½ lb each and containing 2 lb of Cr). Contract, carload, bulk, 19c per lb of briquet, carload packed in box pallets 19.2c, in bags 20.1c; 3000 lb to c.l. in box pallets 20.4c; 2000 lb to c.l. in bags, 21.3c; less than 2000 lb in bags 22.2c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing 2 lb of Mn). Contract, carload, bulk 14.8c per lb of briquet, c.l. packed pallets 15c, bags 16c; 3000 lb to c.l., pallets 16.2c; 2000 lb to c.l. bags, 17.2c, less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing 2 lb of Mn and approx. ⅛ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet, c.l. packed, pallets, 15.8c; bags 16.3c, 3000 lb to c.l., pallets, 16.5c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing 2 lb of Si). Contract, carload, bulk, 7.7c per lb of briquet, packed, pallets, 7.9c; bags 8.9c; 3000 lb to c.l., pallets 9.5c; 2000 lb to c.l. bags 10.5c; less ton 11.4c. Delivered. Spot, add 0.25c. (Small size—weighing approx. 2½ lb and containing 1 lb of Si). Carload, bulk 7.8c. Packed, pallets 8.05c; bags 9.05c; 3000 lb to c.l. pallets 9.65c; 2000 lb to c.l. bags 10.65c; less ton 11.55c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.41 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $3.15 per lb of contained W; 2000 lb W to 5000 lb W, $3.25; less than 2000 lb W, $3.37. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $6.90 per lb of contained Cb. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb plus Ta 60% min, C 0.30% max). Ton lots 2" x D, $4.95 per lb of contained Cb plus Ta, delivered; less ton lots $5.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, c.l. packed ½-in. x 12 M 19c per lb of alloy, ton lots 20.15c, less ton 21.4c. Delivered. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 19c per lb of alloy, ton lots 20.15c; less ton lots 21.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

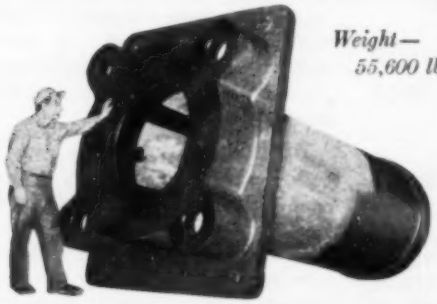
V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.1c per lb of alloy; ton lots 19.55c; less ton lots 20.8c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 18.50c. Packed c.l. 19.50c, 2000 lb to c.l. 20.50c, less than 2000 lb 21c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carload, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.68 in all sizes except powdered which is $1.74.

Technical Molybdic-Oxide: Per lb contained Mo, in cans, $1.39; in bags, $1.38, f.o.b. Langeloth and Washington, Pa.



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Pressure Eases in Scrap Market

STEEL's composite on the steelmaking grades continues to decline. Mills show less interest in offerings despite high level steel ingot operations

Scrap Prices, Page 126

Philadelphia — Following recent purchases by U.S. Steel's Fairless Works of prime steel grades at $61, delivered, No. 2 heavy melting at $54, and No. 2 bundles at $52, the general market on these grades has declined. It is off $2 to $61 on No. 1 heavy melting, No. 1 bundles and No. 1 busheling, and has dropped an average of $1 a ton on No. 2 heavy melting and No. 2 bundles.

All other steel grades are off also, with electric furnace bundles now holding at $64-$65, delivered, mixed borings and turnings, $45, machine shop turnings, $44-$45, and short shoveling turnings at $48. Also, heavy turnings have dropped to a range of $56-$57, delivered, low phos structurals and plates to $66-$68, couplers, springs and wheels to $72, and rail crops, 2-ft and under, to $82.

Accumulation of steel scrap for export, with at least two cargoes scheduled to leave here this month and other ships due for loading in February, is tending to stabilize the market somewhat. Also, adverse weather conditions have slowed collections.

Buffalo—No. 1 heavy melting steel is down $1 to $61-$62; unchanged are No. 2 heavy melting at $52-$53, and No. 2 bundles at $49. Some weakness is noted in railroad scrap, with declines of around $2 being posted on scrap rails and specialties. Blast furnace material is a little easier.

Chicago—Prices on steelmaking grades of scrap are off $1 to $7 a ton in purchases made since the beginning of the new year. About half of the drop was netted in sales during the past week. A leading mill has purchased representative tonnages to establish the new market range.

Pittsburgh—A large steelmaker here bought No. 1 heavy melting at $63, No. 2 heavy melting at $56 and No. 2 bundles at $50 last week. The buy was considered a "representative tonnage." It confirmed reports that the market is reacting to the rapid increases of late 1956. One month ago, in its last purchase, the same mill paid $67, $59 and $54 for the three principal grades.

New York—Brokers have reduced their buying prices on No. 1 heavy melting and No. 1 bundles to $56, and on No. 2 heavy melting to $47-$48. Other changes include a reduction in mixed borings and turnings to $37-$38, and in short shoveling turnings to $40-$41. Unstripped motor blocks are higher at $39-$40, and 18-8 borings and turnings at $345-$370.

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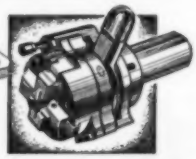

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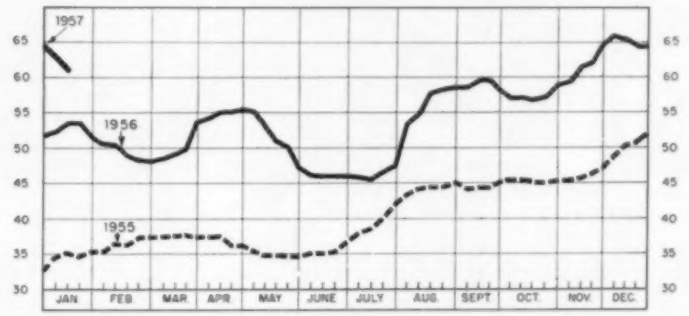
STEELMAKING SCRAP PRICE COMPOSITE

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania—Compiled by STEEL.



Jan. 9 1957	Week Ago	Month Ago	Year Ago	Dec. Avg.
$60.83	$63.17	$65.50	$53.33	$64.29

Cleveland—The market is very dull, both here and in the Valley. The mills are not buying currently and as a result there is considerable uncertainty as regards representative prices. Dealers and brokers say material can be had today at least $3 a ton under the last purchases. This would bring No. 1 heavy melting steel at Cleveland to a range of $60-$61, and at Youngstown to $63-$64.

Detroit — The scrap market is steady following a slump in prices after the December auto lists were closed. Indications are that the market will hold at present level through January. There is slightly increased demand for the foundry grades. Malleable is in short supply. Only one carload was sold in December. Demand, however, is not too strong.

Cincinnati — Scrap prices skidded here from $2 to $3 a ton on most grades as the local mills bought for January. No. 1 heavy melting is off $2 to $59-$60, brokers' buying prices.

St. Louis—Scrap prices fell the last 10 days, declines ranging from $1.50 to $5 a ton. Heavy melting and bundles slipped as much as $5. Cast iron grades dropped $1.50 to $3 a ton. Railroad grades are off similarly.

Birmingham — Activity in the scrap market continues moderate. An Atlanta steel mill last week returned to the market for No. 2 heavy melting at $48, delivered, down $2 from its last buy.

Electric furnace grades, except for a few items, are steady.

Export prices at some ports are off $2 to $4 a ton, but a number of sales are reported at former prices for delivery into February.

Seattle—Scrap prices are quoted up $2 a ton, No. 1 heavy melting now being pegged at $56, No. 2 heavy melting at $53 and No. 1 bundles at $53. These prices are expected to hold through January.

Los Angeles—Prices are off since the first of the year, but the market undertone generally is considered firm. No. 1 heavy melting is quoted at $54, down $1; No. 2 is off $2 to $52; No. 1 bundles are off $1 to $53, No. 2 bundles $7 to $40 and No. 1 cupola cast $4 to $58.

San Francisco — Steel scrap prices have headed upward again here, but it is believed that the higher prices will have difficulty holding. Steel items went up $1 to $4 a ton. Cast grades tagged along for gains of $2 to $3 a ton.

Pig Iron . . .

Pig Iron Prices, Page 120

Most pig iron sellers look for the best business this month since last November. The pickup in inquiry is due to the higher rate of operations at most foundries and to resumption of buying for replenishment of inventories.

Steel mills are continuing to use a very high percentage of their blast furnace output in their own open-hearth melts.

United States Steel Corp. has blown in its No. 5 blast furnace at the Edgar Thomson Works at Braddock, Pa., following a partial relining.

January production at the Mystic Iron Works, Everett, Mass., will be reduced by tonnages lost in a strike.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 121

Oven coke prices have been advanced $1 to $1.25 at various Midwest points. The oven price at St. Paul is now $29.75, up $1.25. With a $3.39 transportation charge from St. Paul, the Chicago delivered price is now $33.14. This is the price which all other area coke producers are meeting in the Chicago market.

Advances of $1 a ton at other points yield the following oven prices: Milwaukee, $30.50; Indianapolis and Terre Haute, Ind., $29,-75; St. Louis, $31.50; Painesville, O., $30.50.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

600 tons, building and fuel storage facilities, Air National Guard, Toledo (O.) Express Airport, to Kilroy Structural Steel Co., Cleveland; Ferber Co., Hackensack, N.J., general contractor.

555 tons, plant addition, Sylvania Electric Products Co., Danvers, Mass., to the American Bridge Division, U.S. Steel Corp., Pittsburgh; Vappi & Co., Cambridge, Mass., general contractor; 60 tons of reinforcing bars, Concrete Steel Co., Boston.

470 tons, motor service shop and hangar, Air Force Base, Manchester, N.H., to the Pittsburgh Bridge & Iron Co., Pittsburgh; Davison Construction Co., Manchester, general contractor; 50 tons, reinforcing bars, to Bethlehem Steel Co., Bethlehem, Pa.

350 tons, replacement beams, piers 2, 3 and 4, Army terminal, Brooklyn, N.Y., to the Central Iron Works, New York.

STRUCTURAL STEEL PENDING

8000 tons, Northern Illinois toll highway, Tri-State route contract ST-8, superstructure of bridge over Milwaukee railroad and Manheim road, Cook County, Ill., for Illinois State Toll Highway Commission, Chicago; bids Jan. 24.

1681 tons, bridges N-7-9 and N-7-13, Northern Illinois toll highway contract SNI-2C, Des Plaines, Ill., for Illinois State Toll Highway Commission, Chicago; bids Jan. 17.

954 tons, two state bridges, involving 650 and 304 tons, respectively, York County, Pa.; H. J. Williams, York, Pa., is low on the general contract.

985 tons, state bridge work, Montgomery County, Pa.; James D. Morrissey, Philadelphia, is low on the general contract.

800 tons, bridges N-3-2 in Belvidere, Ill., and N-6-6 in Barrington, Ill., Northern Illinois toll highway contract SNI-2A, for Illinois State Toll Highway Commission, Chicago; bids Jan. 17.

623 tons, bridges N-3-3 in Belvidere, Ill., and N-7-4 in Des Plaines, Ill., Northern Illinois toll highway contract SNI-2B, for Illinois State Toll Highway Commission, Chicago; bids Jan. 17.

422 tons, bridges, Northern Illinois toll route contract N-3A, Guilford Township, Winnebago County, Ill., and Belvidere Township, Boone County, Ill., for Illinois State Toll Highway Commission, Chicago; bids Jan. 17.

350 tons, including plates, Argonne low power reactor, including tanks, Atomic Energy Commission, Idaho Falls, Idaho.

(*Please turn to page* 132)

Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Jan. 9	$60.83
Jan. 2	63.17
Dec. Avg.	64.29
Jan. 1956	52.17
Jan. 1952	43.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	62.00-63.00
No. 2 heavy melting	*55.00-56.00*
No. 1 bundles	62.00-63.00
No. 2 bundles	49.00-50.00
No. 1 busheling	62.00-63.00
Machine shop turnings	42.00-43.00
Mixed borings, turnings	42.00-43.00
Short shovel turnings	46.00-47.00
Cast iron borings	46.00-47.00
Cut structurals, 3 ft. lengths	72.00-73.00
Heavy turnings	*57.00-58.00*
Punchings & plate scrap	72.00-73.00
Electric furnace bundles	72.00-73.00

Cast Iron Grades

No. 1 cupola	54.00-55.00
Heavy breakable cast	*50.00-51.00*
Unstripped motor blocks	40.00-41.00
No. 1 machinery cast	61.00-62.00

Railroad Scrap

No. 1 R.R. heavy melt.	71.00-72.00
Rails, 2 ft and under	81.00-82.00
Rails, 18 in. and under	82.00-83.00
Rails, random lengths	79.00-80.00
Railroad specialties	75.00-76.00

Stainless Steel Scrap

18-8 bundles & solids	480.00-520.00
18-8 turnings	400.00-420.00
430 bundles & solids	110.00-120.00
430 turnings	80.00-85.00

CLEVELAND

No. 1 heavy melting	*60.00-61.00*
No. 2 heavy melting	*51.00-52.00*
No. 1 bundles	*60.00-61.00*
No. 2 bundles	44.00-45.00
No. 1 busheling	*60.00-61.00*
Machine shop turnings	35.00-36.00
Mixed borings, turnings	38.00-39.00
Short shovel turnings	38.00-39.00
Cast iron borings	38.00-39.00
Cut foundry steel	*58.00-59.00*
Low phos.	64.00-65.00
Cut structural plates 2 ft and under	*68.00-69.00*
Alloy free, short shovel turnings	43.00-44.00
Electric furnace bundles	*61.00-62.00*

Cast Iron Grades

No. 1 cupola	*57.00-58.00*
Charging box cast	*49.00-50.00*
Heavy breakable cast	*47.00-48.00*
Stove plate	*53.00-54.00*
Unstripped motor blocks	38.00-39.00
Brake shoes	47.00-48.00
Clean auto cast	*56.00-57.00*
Burnt cast	44.00-45.00
Drop broken machinery	*59.00-60.00*

Railroad Scrap

No. 1 R.R. heavy melt.	67.00-68.00
R.R. malleable	71.00-72.00
Rails, 2 ft and under	86.00-87.00
Rails, 18 in. and under	87.00-88.00
Rails, random lengths	83.00-84.00
Cast steel	71.00-72.00
Railroad specialties	77.00-78.00
Uncut tires	76.00-77.00
Angles, splice bars	78.00-79.00
Rails, rerolling	85.00-86.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	450.00-500.00
18-8 turnings	300.00-310.00
430 clips, bundles, solids	115.00-120.00
430 turnings	55.00-65.00

YOUNGSTOWN

No. 1 heavy melting	*63.00-64.00*
No. 2 heavy melting	57.00-58.00
No. 1 bundles	*63.00-64.00*
No. 2 bundles	49.00-50.00
No. 1 busheling	*63.00-64.00*
Machine shop turnings	36.00-37.00
Short shovel turnings	43.00-44.00
Cast iron borings	43.00-44.00
Low phos.	67.00-68.00
Electric furnace bundles	*64.00-65.00*

Railroad Scrap

No. 1 R.R. heavy melt.	68.00-69.00

CHICAGO

No. 1 heavy melting	*57.00-61.00*
No. 2 heavy melting	*47.00-48.00*
No. 1 factory bundles	*64.00-65.00*
No. 1 dealer bundles	*58.00-59.00*
No. 2 bundles	*45.00-46.00*
No. 1 busheling	*57.00-61.00*
Machine shop turnings	*37.00-38.00*
Mixed borings, turnings	*39.00-40.00*
Short shovel turnings	*39.00-40.00*
Cast iron borings	*39.00-40.00*
Cut structurals, 3 ft	*66.00-67.00*
Punchings & plate scrap	*67.00-68.00*

Cast Iron Grades

No. 1 cupola	50.00-51.00
Stove plate	46.00-47.00
Unstripped motor blocks	39.00-40.00
Clean auto cast	55.00-56.00
Drop broken machinery	55.00-56.00

Railroad Scrap

No. 1 R.R. heavy melt.	*62.00-63.00*
R.R. malleable	*68.00-69.00*
Rails, 2 ft and under	*82.00-83.00*
Rails, 18 in. and under	*83.00-84.00*
Angles, splice bars	*71.00-72.00*
Rails, rerolling	*84.00-85.00*

Stainless Steel Scrap

18-8 bundles & solids	505.00-515.00
18-8 turnings	355.00-375.00
430 bundles & solids	105.00-110.00
430 turnings	60.00-65.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*53.00*
No. 2 heavy melting	*46.00*
No. 1 bundles	*54.00*
No. 2 bundles	*41.00*
No. 1 busheling	*53.00*
Machine shop turnings	30.00
Mixed borings, turnings	32.00
Short shovel turnings	33.00
Punchings & plate scrap	63.50

Cast Iron Grades

No. 1 cupola	*51.00*
Charging box cast	*44.00*
Stove plate	45.00
Heavy breakable	44.00
Unstripped motor blocks	32.00
Clean auto cast	*55.00*
Malleable	*56.00*

(Brokers' buying prices)

ST. LOUIS

No. 1 heavy melting	*51.00*
No. 2 heavy melting	*48.50*
No. 1 bundles	*51.00*
No. 2 bundles	*42.50*
No. 1 busheling	*51.00*
Machine shop turnings	36.00
Short shovel turnings	38.50

Cast Iron Grades

No. 1 cupola	*48.00*
Charging box cast	*44.00*
Heavy breakable cast	*44.00*
Unstripped motor blocks	*42.50*
Brake shoes	51.00
Clean auto cast	53.00
Stove plate	43.00

Railroad Scrap

No. 1 R.R. heavy melt.	66.00
Rails, 18 in. and under	*83.00*
Rails, rerolling	*83.00*
Rails, random lengths	*78.50*
Angles, splice bars	70.00

PHILADELPHIA

No. 1 heavy melting	*61.00*
No. 2 heavy melting	*54.00*
No. 1 bundles	*61.00*
No. 2 bundles	*52.00*
No. 1 busheling	*61.00*
Electric furnace bundles	*64.00-65.00*
Mixed borings, turnings	*45.00*
Machine shop turnings	*44.00-45.00*
Short shovel turnings	*48.00*
Heavy turnings	*56.00-57.00*
Structurals & plates	*66.00-68.00*
Couplers, springs, wheels	*72.00*
Rails, crops, 2 ft & under	*82.00*

Cast Iron Grades

No. 1 cupola	54.00-56.00
Malleable	*67.00-68.00†*
Heavy breakable cast	59.00
Drop broken machinery	60.00-61.00

†Nominal.

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*56.00*
No. 2 heavy melting	*47.00-48.00*
No. 1 bundles	*56.00*
No. 2 bundles	46.00-47.00
Machine shop turnings	36.00-37.00
Mixed borings, turnings	*37.00-38.00*
Short shovel turnings	*40.00-41.00*
Low phos. (structural & plate)	59.00-60.00

Cast Iron Grades

No. 1 cupola	46.00-47.00
Unstripped motor blocks	*39.00-40.00*
Heavy breakable	50.50-51.50

Stainless Steel

18-8 sheets, clips, solids	475.00-485.00
18-8 borings, turnings	*345.00-370.00*
430 sheets, clips, solids	110.00-115.00
410 sheets, clips, solids	100.00-105.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	51.50-52.00
No. 2 heavy melting	41.00-41.50
No. 1 bundles	51.50-52.00
No. 2 bundles	*38.50-39.50*
No. 1 busheling	51.50-52.00
Machine shop turnings	33.50-34.00
Mixed borings, turnings	34.00-34.50
Short shovel turnings	37.50-38.00
No. 1 cast	44.50-45.50
Mixed cupola cast	42.00-43.00
No. 1 machinery cast	45.00-46.00

BUFFALO

No. 1 heavy melting	*61.00-62.00*
No. 2 heavy melting	52.00-53.00
No. 1 bundles	*61.00-62.00*
No. 2 bundles	48.00-49.00
No. 1 busheling	*61.00-62.00*
Mixed borings, turnings	38.00-39.00
Machine shop turnings	39.00-40.00
Short shovel turnings	43.00-44.00
Cast iron borings	34.00-35.00
Low phos.	65.00-66.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	49.00-50.00
No. 1 machinery	54.00-55.00

Railroad Scrap

Rails, random lengths	*69.00-70.00*
Rails, 3 ft and under	*75.00-76.00*
Railroad specialties	*68.00-69.00*

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*59.00-60.00*
No. 2 heavy melting	*51.00-58.00*
No. 1 bundles	*59.00-60.00*
No. 2 bundles	*43.00-44.00*
No. 1 busheling	*59.00-60.00*
Machine shop turnings	*39.50-40.50*
Mixed borings, turnings	*37.50-38.50*
Short shovel turnings	42.50-43.50
Cast iron borings	*37.50-38.00*
Low phos. 18 in.	*66.00-67.00*

Cast Iron Grades

No. 1 cupola	*47.00-48.00*
Heavy breakable cast	*46.00-47.00*
Charging box cast	*47.00-48.00*
Drop broken machinery	*58.00-59.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*60.00-61.00*
Rails, 18 in. and under	*79.00-80.00*
Rails, random lengths	*71.00-72.00*

BIRMINGHAM

No. 1 heavy melting	46.00-47.00
No. 2 heavy melting	44.00-45.00
No. 1 bundles	46.00-47.00
No. 2 bundles	38.00-39.00
No. 1 busheling	46.00-47.00
Cast iron borings	27.00-28.00
Short shovel turnings	40.00-41.00
Machine shop turnings	39.00-40.00
Bar crops and plate	64.00-65.00
Structurals & plate, 2 ft	63.00-64.00
Electric furnace bundles	56.00-57.00
Cut foundry steel	54.00-55.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	52.00-53.00
Stove plate	51.00-52.00
Unstripped motor blocks	44.00-45.00
Charging box cast	40.00-41.00
No. 1 wheels	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt.	*61.00-62.00*
Rails, 18-in. and under	*74.00-75.00*
Rails, rerolling	82.00-83.00
Rails, random lengths	*69.00-70.00*
Angles, splice bars	*66.00-67.00*

SEATTLE

No. 1 heavy melting	*56.00*
No. 2 heavy melting	*53.00*
No. 1 bundles	*53.00*
No. 2 bundles	*33.00-35.00*
Machine shop turnings	*30.00-32.00*
Mixed borings, turnings	*30.00-32.00*
Electric furnace No. 1	62.00-65.00

Cast Iron Grades

No. 1 cupola	54.00-56.00
Heavy breakable cast	*48.00-50.00*
Unstripped motor blocks	*48.00-49.00*
Stove plate (f.o.b. plant)	*42.00-43.00*

LOS ANGELES

No. 1 heavy melting	*54.00*
No. 2 heavy melting	*52.00*
No. 1 bundles	*53.00*
No. 2 bundles	*40.00*
Machine shop turnings	32.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	*58.00*

SAN FRANCISCO

No. 1 heavy melting	*56.00*
No. 2 heavy melting	*54.00*
No. 1 bundles	*55.00*
No. 2 bundles	*44.00*
Machine shop turnings	*38.00*
Mixed borings, turnings	*38.00*
Cast iron borings	*38.00*
Heavy turnings	*38.00*
Short shovel turnings	*41.00*
Cut structurals	*64.00*

Cast Iron Grades

No. 1 cupola	*60.00*
Charging box cast	*47.00-49.00*
Stove plate	48.00
Heavy breakable cast	42.00
Unstripped motor blocks	50.00
Clean auto cast	*60.00*
No. 1 wheels	*50.00*
Drop broken machinery	*62.00*

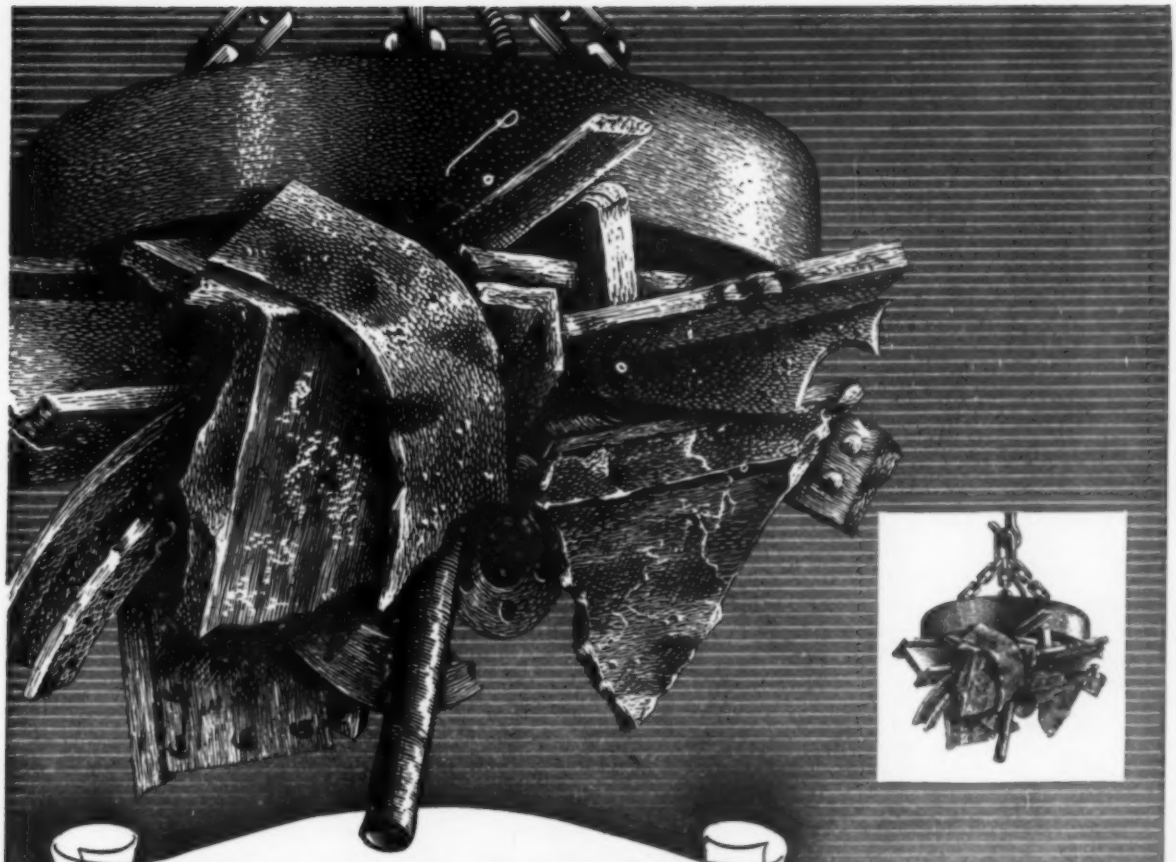
HAMILTON, ONT.

No. 1 heavy melting	54.00
No. 2 heavy melting	47.00
No. 1 bundles	54.00
No. 2 bundles	40.50
Mixed steel scrap	46.00
Busheling, new factory: Prepared	52.00
Unprepared	48.00
Short steel turnings	35.00

Cast Iron Grades†

No. 1 machinery cast	50.00

†F.o.b., Hamilton, Ont.



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EXPORTS-IMPORTS **LIVINGSTON & SOUTHARD, INC.** 99 Park Ave., New York, N. Y. *Cable Address:* FORENTRACO

Supply Outstrips Demand

Competition will keynote 1957. Now that availability is no longer the big problem, look for stability in prices—possibly some weakness

Nonferrous Metal Prices, Pages 130 & 131

COMPETITION will be fierce this year. That's the consensus of nonferrous metals men. They also agree that most producers will try to maintain present prices or lower them. Finally, they think this will be a near record year for most metals.

Copper—Foreign demand is running higher than expected. Some observers feel this is due to the fact that Chilean production can be bought on a fixed price basis (contracts may be running as long as six months). Many small European manufacturers prefer to have a stable price for a few months ahead rather than gamble on the London Metal Exchange quotations. The LME spot ask price was 33.60 cents a pound last week. Chilean copper for the foreign market costs 34 cents a pound plus freight. These charges bring the cost to about the 36 cent a pound level, the American primary producers' price.

The most important copper market — wire and cable makers — is providing early strength for red metal producers this year. Those sales are running at peak levels. Brass mill executives are beginning to talk more confidently, but shipments of brass mill products are still off. Most foresee a slow but steady first quarter buildup.

Zinc—U.S. December production reached the 1956 high of 98,234 tons. Last year's domestic shipments reached 869,260 tons, a drop of 138,359 tons from the 1955 figure. Bright spot: With the help of government stockpiling, total shipments still topped the 1-million ton mark (1,035,301 tons). During 1955, total shipments reached 1,114,316 tons.

The American Zinc Institute estimates that 1956 consumption figures will show that galvanizers took some 429,000 tons of zinc; diecasters, 359,000 tons; brass mills, 121,000 tons. Consumption of rolled zinc reached about 47,000 tons and some 36,000 tons were used for other purposes, such as higher grade zinc oxide.

January sales to galvanizers are at a record rate as the steel industry continues to operate near capacity. Diecasters' orders dropped off during the holidays and are beginning to build back to more normal levels. Zinc for brass mills is still in the depths.

Lead — Sales are fair to good. All producers are looking for more customers as the year commences, but they are optimistic about first quarter. Sales to the tetraethyl lead industry are running at top level. The use of lead for atomic energy applications (radiation shielding) and the growing use of leaded steel is helping to buoy industry confidence.

Tin—Prices will continue to drift downward. A threatened smelter strike held up the spot price at about $1.00 a pound during the week. But with the U.S. disposal of the Texas City tin smelter to Wah Chang Corp., the extra tin ores being made available should bring tin to its more normal level of 95 cents a pound. Wah Chang will make tungsten and tin alloys at the smelter, for which it paid the government $1,350,000. A maximum of $2 million will be paid later, depending on production.

World tin smelter production (minus China and Russia) reached an estimated 150,000 long tons in 1956, reports the International Tin Study Group. The U.S. consumed 59,085 long tons. Free world estimated use: 152,000 long tons.

Nickel Note — With no fanfare, the U.S. has moved the responsibility for watching nickel supplies from the Iron & Steel Division, Business & Defense Services Administration, to the Miscellaneous Metals & Minerals Division.

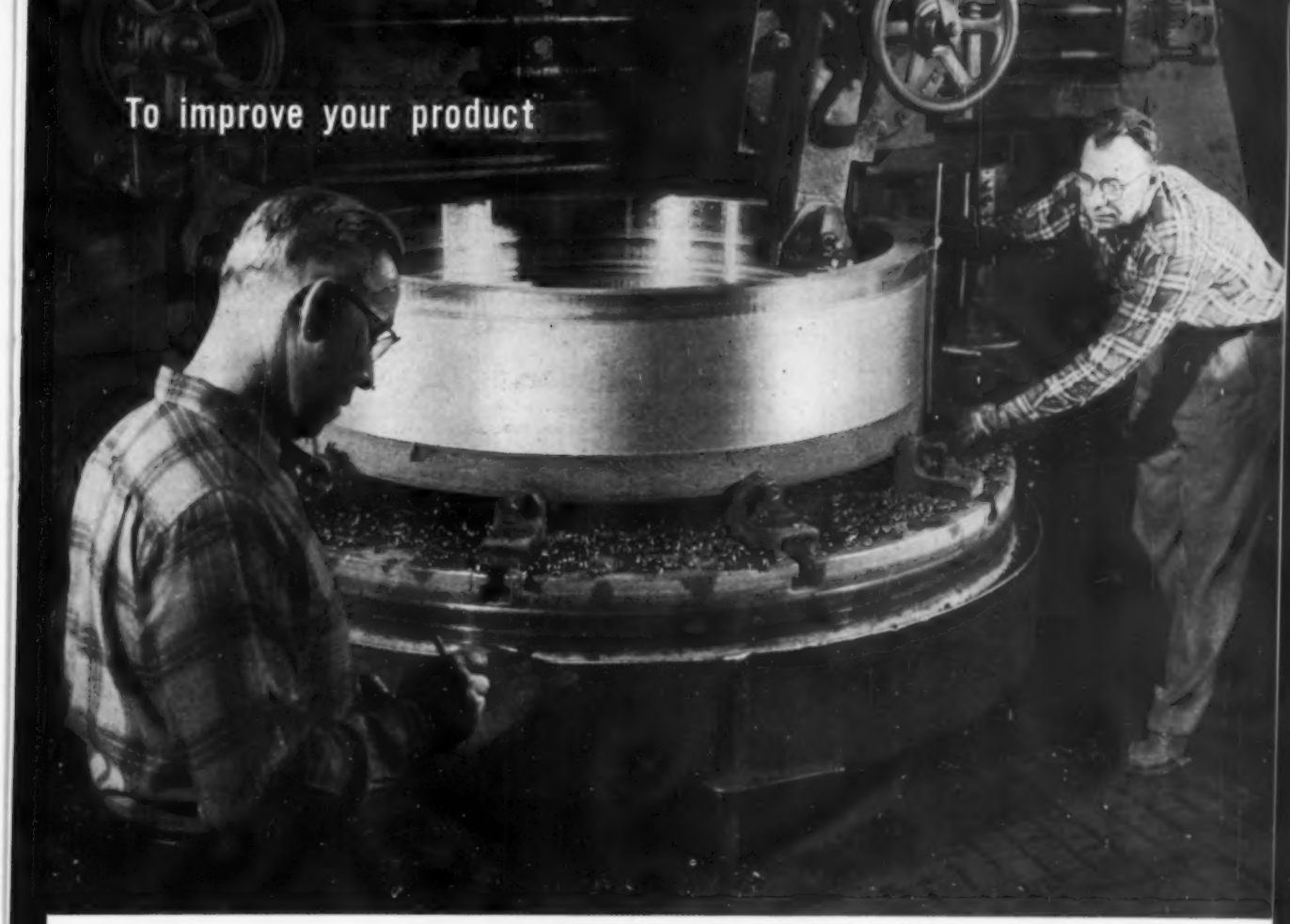
Market Memos

- November primary magnesium production reached a three-year monthly high of 6818 tons. The 11-month total is 61,130 tons. December estimates indicate that the 1956 total will be 68,000 tons, as predicted earlier this year.
- The development of a tungsten-base alloy for jet aircraft is the goal of tungsten producers in '57.
- BDSA had changed its base period for figuring aluminum set-asides for defense and AEC orders. New base is pegged to total shipments of each form and shape during first six calendar months of 1956. Old base was on fourth quarter, 1952. Reason: More aluminum than necessary to fill rated orders is being set aside, a result of figuring percentages of 1952 shipments against greatly expanded 1956 capacity. The new setup will first apply on second quarter, 1957, orders.

NONFERROUS PRICE RECORD

	Price Jan. 9	Last Change	Previous Price	Dec. Avg.	Nov. Avg.	Jan., 1956 Avg.
Aluminum ..	27.10	Aug. 10, 1956	25.90	27.100	27.100	24.400
Copper	35.00–36.00	Dec. 19, 1956	35.50–36.00	35.650	35.956	46.700
Lead	15.80	Jan. 13, 1956	16.30	15.800	15.800	15.960
Magnesium .	35.25	Aug. 13, 1956	33.75	35.250	35.250	32.500
Nickel	74.00	Dec. 6, 1956	64.50	70.880	64.500	64.500
Tin	100.50	Jan. 9, 1957	99.50	104.465	111.049	105.067
Zinc	13.50	Jan. 6, 1956	13.50	13.500	13.500	13.440

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99 + %, deld.; MAGNESIUM, pig, 99.8%, Velasco, Tex.



BUY PROFIT IN ALCO CIRCULAR FORGINGS

Hi-Qua-Led* Steel forgings, available in any AISI Open Hearth Grade, can reduce machining time more than half, or increase tool life up to 1600 per cent. ALCO's experience and equipment build cost-reducing uniformity into standard circular forgings from 18- to 145-in. OD.

The big news is Hi-Qua-Led Steel. It was developed by ALCO to lower your machining costs on circular forgings — particularly in applications where a lot of metal must be removed. So far, customers using Hi-Qua-Led Steel forgings have reported as high as 69 per cent improvement in turning time, 41.2 per cent in teeth-cutting time. Hobbing tool life has been increased up to 1600 per cent. Even surface finish has been improved markedly.

There is no change in steel properties in Hi-Qua-Led Steel. It can be expected to perform exactly like a regular steel in the same grade. Customers report same response to heat treatment as regular steels.

You can profitably use Hi-Qua-Led Steel forgings if you put four or more hours machining into a circular forged piece, or if you do hobbing or other tough machining jobs with expensive tools. If your machining is not extensive, ALCO's regular circular forgings can still save you money with their high uniformity and exact conformance to your specifications.

We'd like you to have full information. Your nearest ALCO sales office will be happy to provide it, or, if you wish, you can receive complete explanatory information in Bulletins SF-1 and SF-2 by writing Spring & Forge Division, Dept. OCF-1, P.O. Box 1065, Schenectady 1, New York.

**Trademark reg. applied for. Patent applied for on lead-addition method.*

ALCO

ALCO PRODUCTS, INC.

NEW YORK

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Locomotives · Diesel Engines · Nuclear Reactors · Heat Exchangers · Springs · Steel Pipe · Forgings · Weldments · Oil-Field Equipment

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots 27.10; pigs, 25.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.90; No. 43, 28.70; No. 195, 30.30; No. 13, 28.90; No. 43, 28.70; 30-lb ingots.

Antimony: R.M.M. brand, 99.5%, 33.00; Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.50-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.
Cobalt: 97-99%, $2.60 per lb for 550-lb keg; $2.62 per lb for 100-lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $119.20 per lb, nom.

Copper: Electrolytic, 36.00 deld. Conn. valley; 36.00 deld. Midwest; custom smelters, 35.00 deld.; lake, 36.00 deld.; fire refined, 35.75 deld.

Germanium: First reduction, $201.85-$220 per lb; intrinsic grade, $220-$242.67 per lb, depending on quantity.

Gold: U.S. Treasury, $35 per oz.
Indium: 99.9%, $2.25 per troy oz.
Iridium: $90-$110 nom. per troy oz.
Lead: Common, 15.80; chemical, 15.90; corroding, 15.90, St. Louis. New York basis, add 0.20.

Lithium: 98+%, cups or ingots, $11.50; rod, $13.50; shot or wire, $14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: Pig, 35.25; ingot, 36.00, f.o.b. Velasco, Tex. 13 in. sticks, 59.00, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91B (diecasting), 37.25 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $255-$257 per 76-lb flask.

Molybdenum: Extruded ingot, $9.60 per pound, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot or ingots for addition to cast iron, 74.50; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01.

Osmium: $80-$100 per troy oz, nom.

Palladium: $23-$24 per troy oz.

Platinum: $103-$106 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $118-$125 per troy oz.

Ruthenium: $45-$55 per troy oz.

Selenium: 99.5%, $13.50-$15.50 per lb.

Silver: Open market, 91.375 per troy oz.

Sodium: 16.50, c.l.; 17.00, l.c.l.

Tantalum: Sheet, rod, $68.70 per lb; powder, $56.63 per lb.

Tellurium: $1.50-$1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N.Y., spot, 100.50; prompt, 100.50.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max), $2.75; grade A-2 (0.5% Fe max), $2.50 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $4.20 per lb, nom, f.o.b. shipping point; less than 1000 lb, add 15.00; 99+% hydrogen reduced, $5. Treated ingot, $6.70.

Zinc: Prime Western, 13.50; brass special, 13.75; intermediate, 14.00, East St. Louis, freight allowed over 0.50 per pound. New York basis, add 0.50. High grade, 14.85; special high grade, 15.25 deld. Die casting alloy ingot No. 3, 18.00; No. 2, 19.00; No. 5, 18.50 deld.

Zirconium: Ingots, commercial grade, $14.40 per lb; low-hafnium reactor grade, $23.07. Sponge, commercial grade, $10 per lb; reactor grade, $14-$22 per lb, depending on quantity. Powder electronics grades, $15 per lb; flash grade, $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 24.75-30.00; No. 12 foundry alloy (No. 2 grade), 23.50; 5% silicon alloy, 0.60 Cu max, 25.25-26.25; 13 alloy, 0.60 Cu max, 25.25-26.25; 195 alloy, 23.50-26.50; 108 alloy, 23.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 24.00; grade 2, 22.50; grade 3, 21.75; grade 4, 21.25.

Brass Ingot: Red brass, No. 115, 35.00; tin bronze, No. 225, 46.00; No. 245, 41.50; high-leaded tin bronze, No. 305, 38.50; No. 1 yellow, No. 405, 27.50; manganese bronze, No. 421, 30.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 37.50; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nominal 1.9% Be alloy). Strip, $1.86-$1.91, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.83, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 41.355; l.c.l., 41.98. Weatherproof, 30,000-lb lots, 40.78; l.c.l., 41.53. Magnet wire deld., 15,000 lb or more, 48.68; l.c.l., 49.43.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq ft or more, $21.50 per cwt; pipe, full coils, $21.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheet and strip, $11.00-$14.75; sheared mill plate, $9.25-$11.25; wire $8.50-$11.00; forging billets, $6.85-$7.10; hot-rolled and forged bars, $7.10-$7.35.

ZINC

(Prices per lb, c.l., f.o.b. mill) Sheets, 24.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $20.35; H.R. strip, $23.95; C.R. strip, $32.00; forged or H.R. bars, $18.40; wire, 0.015 in., 8.00c per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strip, C.R.	124	108	128
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheet and Circles: 1100 and 3003 mill finish (30,000 lb base; freight allowed)

Thickness

Range, Inches	Flat Sheet	Coiled Sheet
0.249-0.138	40.90-45.40	....
0.135-0.096	41.40-46.50	37.70-39.60
0.095-0.077	42.10-48.30	37.80-39.80
0.076-0.061	42.70-50.60	38.20-40.50
0.060-0.048	43.40-52.90	38.80-41.50
0.047-0.038	43.90-55.60	38.60-42.90
0.037-0.030	44.30-56.00	40.40-44.70
0.029-0.024	44.90-52.40	41.00
0.023-0.019	45.80-52.20	42.00
0.018-0.017	46.60-53.30	42.60
0.016-0.015	47.50-53.90	43.40
0.014	48.50-50.90	44.40
0.013-0.012	49.70-52.10	45.10
0.011	50.70-53.70	46.30
0.010-0.0095	52.10-54.40	47.60
0.009-0.0085	53.40	49.10
0.008-0.0075	55.00	50.03
0.007	56.50	51.80
0.006	58.10	53.20

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam, 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	40.2	44.5
5050-F	41.3	45.6
3004-F	42.3	47.5
5052-F	42.9	48.2
6061-T6	44.4	50.0
2024-T4*	48.1	54.4
7075-T6*	56.4	62.5

*24-48 in. widths or diam, 72-180 lengths.

Screw Machine Stock: 30,000 lb base.

Diam.(in.)or	Round		Hexagonal	
across flats	2011-T3	2017-T4	2011-T3	2017-T4
Drawn				
0.125	74.30	71.50	....	....
0.156-0.172	63.00	60.40	....	....
0.188	63.00	60.40	....	76.40
0.219-0.234	59.70	57.20	....	....
0.250-0.281	59.70	57.20	....	73.00
0.313	59.70	57.20	....	69.60
0.344	58.50	....	....	....
Cold-finished				
0.375-0.547	58.80	57.50	70.10	65.50
0.563-0.688	58.80	57.50	66.70	61.60
0.750-1.000	57.40	56.00	61.00	58.10
1.063	57.40	56.00	....	56.10
1.125-1.500	55.20	53.90	59.00	56.10
Rolled				
1.563	53.70	52.40	....	....
1.625-2.000	53.10	51.60	....	....
2.125-2.500	51.70	50.30	....	....
2.563-3.375	50.20	48.70	....	....

Forging Stock: Round, Class 1, 43.30-55.90 in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 48.10-63.20 in random lengths, 0.375-4 in. thick width 0.750-10 in.

Pipe: ASA schedule 40, alloy 6063-T6, standard lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size(in.)		Nom. Pipe Size(in.)	
⅜	$18.45	2	$ 57.00
1	29.00	4	157.20
1¼	39.25	6	281.65
1½	46.95	8	423.80

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	45.90-47.50	61.50-65.80
12-14	46.20-47.70	62.20-66.80
15-17	46.40-48.30	63.50-68.50
18-20	47.00-48.80	65.50-71.10

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grade, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.0, 93.30. Thread plate, .188 in., 71.70; .250-2.0 in., 70.60; Tooling plate, .250-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 1100 clippings, 14.00-14.50; old sheets, 11.00-11.50; borings and turnings, 7.50-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	58.13b	55.36c	....	58.32	32.000	32.000	31.250
Yellow Brass	50.19	40.17d	50.73	53.10	24.625	24.375	22.625
Low Brass, 80%	53.40	53.34	53.94	56.21	27.375	27.125	26.625
Red Brass, 85%	54.54	54.48	55.08	57.35	28.500	28.250	27.750
Com. Bronze, 90%	56.23	56.17	56.77	58.79	29.500	29.250	28.750
Manganese Bronze	57.88	51.98	62.22	....	23.000	22.750	22.250
Muntz Metal	52.19	48.00	....	....	23.125	22.875	22.375
Naval Brass	54.14	48.45	61.20	57.55	23.000	22.750	22.250
Silicon Bronze	62.44	61.63	62.48	64.61	31.250	31.000	30.250
Nickel Silver, 10%	66.66	68.99g	68.99	....	30.875	30.675	15.438
Phos. Bronze, A 5%	77.25	77.75	77.75	79.18	33.000	32.750	31.750

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded

8.00; crankcases, 11.00-11.50; industrial castings, 11.00-11.50.

Copper and Brass: No. 1 heavy copper and wire, 27.00-27.50; No. 2 heavy copper and wire, 25.50-26.00; light copper, 23.00-23.50; No. 1 composition red brass, 24.00-24.50; No. 1 composition turnings, 22.50-23.00; yellow brass turnings, 14.00-14.50; new brass clippings, 21.00-21.50; light brass, 14.00-14.50; heavy yellow brass, 16.00-16.50; new brass rod ends, 18.50-19.00; auto radiators, unsweated, 17.50-18.00; cocks and faucets, 18.50-19.00; brass pipe, 19.00-19.50.

Lead: Heavy, 12.50-13.00; battery plates, 7.00-7.25; linotype and stereotype, 13.00-14.00; electrotype, 12.50-13.00; mixed babbitt, 13.00-14.50.

Monel: Clippings, 75.00-90.00; old sheets, 70.00-80.00; turnings, 70.00-80.00; rods, 75.00-90.00.

Nickel: Sheets and clips, 140.00-185.00; rolled anodes, 140.00-185.00; turnings, 125.00-160.00; rod ends, 140.00-185.00.

Zinc: Old zinc, 4.50-5.50; new die-cast scrap, 4.00-4.50; old die-cast scrap, 2.50-3.00.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 18.00-18.25; 3003 clippings, 18.00-18.25; 6151 clippings, 18.00-18.25; 5052 clippings, 17.75-18.00; 2014 clippings, 17.00-17.75; 2017 clippings, 17.00-17.75; 2024 clippings, 17.00-17.75; mixed clippings, 17.00; old sheets, 15.50; old cast, 15.50; clean old cable (free of steel), 17.25-18.00; borings and turnings, 15.00-16.00.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 58.00; light scrap, 54.00; turnings and borings, 38.00.

Copper and Brass: No. 1 heavy copper and wire, 30.00; No. 2 heavy copper and wire, 28.50; light copper, 26.25; refinery brass (60% copper) per dry copper content, 26.75-27.00.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper and Brass: No. 1 heavy copper and wire, 30.00; No. 2 heavy copper and wire, 28.50; light copper, 26.25; No. 1 composition borings, 26.50; No. 1 composition solids, 27.00; heavy yellow brass solids, 19.00; yellow brass turnings, 19.00; radiators, 21.00.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 54.79; oval 53.92, 5000-10,000 lb; electrodeposited, 45.78; 2000-5000 lb lots; cast, 48.04, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, $1.015; 100-499 lb, 99.50; 500-4999 lb, 95.50; 5000-29,999 lb, 93.50; 30,000 lb, 91.50. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab; less than 200 lb, 118.50; 200-499 lb, 117.00; 500-999 lb, 116.50; 1000 lb or more, 116.00.

Zinc: Balls, 21.00; flat tops, 21.00; flats, 22.75; ovals, 22.00, ton lots.

INDUSTRIAL ENGINEERS

Multi-Million dollar expansion of our operating facilities has created opportunities in industrial engineering for young men trained or experienced in wage incentive programming, methods engineering, and statistical quality control.

1 to 3 years experience will qualify. Professional status assured. Openings at our Fontana plant in Southern California.

Send complete resume to Employment Manager

KAISER STEEL CORP.

P. O. Box 217
Fontana, California

ONE OF THE WORLD'S LARGEST LATHES?

Niles Boring & Turning Engine Lathe—16' x 56' Ctrs. Rapid Traverse—100 HP. Wt: 200 tons.

•

16'x¼" Niagara Shear—Late Type

•

Torrington & Waterbury Farrel 12 Roll Tube Straighteners

•

Plate Bending Roll—Pinch Type
1" Cap. x 16' Long, MD w/controls
Can Be Seen In Operation.

•

16'x¾" Birdsboro Brake

•

12' x 12' x 30' Niles Planer

•

7'x17" Fosdick Radial—1940

•

5" Ohio Floor Type Horiz. Bor. Mill '42

•

30" Pratt & Whitney 2 spdl profiler

•

28" Cinc. 2 spdl. Hydrotel—1942

•

72" Gould & Eberhardt Gear Hobber

•

OVER 2500 MACHINE TOOLS IN STOCK

S & S MACHINERY CO.
140 53rd St., Bklyn, N.Y.
HY 2-7400

CARBIDE SALESMEN

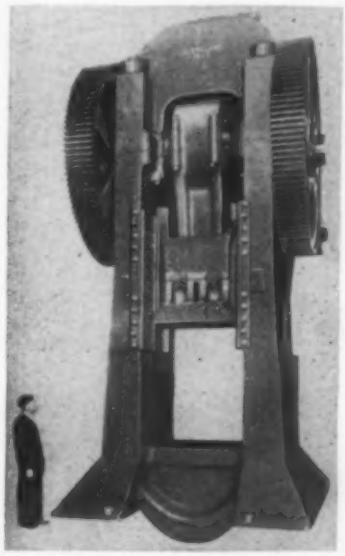
Excellent opportunities available in Chicago, Cleveland, Buffalo, Milwaukee, Philadelphia, Indianapolis and Boston areas with manufacturer of top quality carbides. Salary, incentive, expenses. Write Box 500, STEEL, Penton Bldg., Cleveland 13, Ohio.

CLASSIFIED

Help Wanted

ESTABLISHED INDUSTRIAL ROOFING AND painting contractor looking for active or retired person with industrial management experience to enter business as partner. Person not required to have industrial experience. Person can be active or inactive in business. Pittsburgh, Chicago, or Eastern States. Replies held in strict confidence. Reply Box 501, STEEL, Penton Bldg., Cleveland 13, Ohio.

FOR CLASSIFIED RATES
And Further Information write
STEEL, Penton Bldg., Cleveland 13, O.



MACHINERY FOR IMMEDIATE SALE

1800 T. Cleveland Single Crank Straight Side Press, 16" new '42 str; bed 56" x 56"; 20SPM; air clutch, 250 HP 3/60/440; Location - Midwest—Price:—very reasonable. FOB cars or truck.

4000 T. Clearing Forging Press, new '44, 16" str, bed 66' x 65" 40" max. shutheight, can be seen oper. very good condition.

1500 T. W. Stillman Hydraulic Press, ram 36" dia. str. 12" w/Vickers Pump new '52; and 150# boiler, good condition.

1200 T. United Eng. #10 Steam Forging Press, 4 columns, new cost $170,000; 6' btwn columns; good condition.

400 T. W. STILLMAN DOWNACTING HI SPEED METAL WORKING PRESS, self-cont'd, 26" str; bed 30" FB x 36" RL; 18" ram diameter.

90 T. BLISS #6 DOUBLE ACTION PRESS, 2" inner & 5" outer stroke; new '42. 13" shutheight, drawing slide 16½", 85 SPM, excellent condition.

7" UNITED Alligator Shear, crank oper. 6½" x 6½" mild steel, rebit.

4" UNITED Alligator Shear, #5, new '36, 24" blade, 19 SPM. $6950.

E. J. McCallum, Jr.

EVEREADY SUPPLY CO.
BOX 638, BRIDGEPORT, CONN.
EDison 4-9471

WAREHOUSE AND FOUNDRY

Located in Greenville, S. C., center textile industry plus other steel customers. Private R. R. siding level with second floor, gravity feed to first floor. Also, truck loading platforms. 125,000 sq. ft. All utilities. For sale or lease, already financed.

ALESTER G. FURMAN CO.
Established 1888

CAINE REALTY & MTG. CO.
Greenville, S. C.

(*Concluded from page* 125)

302 tons, state bridge work, Lancaster County, Pa.; bids Jan. 18.

REINFORCING BARS . . .

REINFORCING BARS PLACED

600 tons, Swift river power dam, Washington state, for the Pacific Power & Light Co., Portland, Oreg., to Soule Steel Co., Portland; Jones & Tompkins, Seattle, general contractor.

475 tons, dormitories, Otis AFB, Falmouth, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; S. Volpe & Co., Boston, general contractor.

310 tons, admission and treatment building, State Hospital, Medfield, Mass., to Joseph T. Ryerson & Son Inc., Boston; Park Construction Co., Boston, general contractor.

225 tons, municipal parking garage, Providence street, Boston, to the Northern Steel Inc., Medford, Mass.; Coleman Bros., Boston, general contractor.

175 tons, Denny hall reconstruction, University of Washington, to Bethlehem Pacific Coast Steel Corp., Seattle.

150 tons, two Washington state bridges, Skagit and King counties, to Northwest Steel Rolling Mills Inc., Seattle.

REINFORCING BARS PENDING

2800 tons, Navy pier, Newport, R.I.; M. Perini & Sons Co., Framingham, Mass., and Raymond Concrete Pile Co., New York, joint contractors.

1800 tons, six-lane bridge structure, Northern Illinois toll highway contract T-8A, Bensonville, Cook County, Ill., for the Illinois State Toll Highway Commission, Chicago; bids Jan. 24.

700 tons, spar mill, for Boeing Airplane Co., Seattle; bids in.

490 tons, Northern Illinois toll highway contract E-1D, including erection of precast concrete bridges, Naperville and Lisle Townships, DuPage County, Ill., for the Illinois State Toll Highway Commission, Chicago; bids Jan. 24.

306 tons, North Illinois toll route contract N-3A, including precast concrete bridges, Guilford Township, Winnebago County, Ill., and Belvidere Township, Boone County, Ill., for the Illinois State Toll Highway Commission, Chicago; bids Jan. 17.

350 tons, Northern Illinois toll highway contract T-11A, including erection of precast concrete bridges, Northfield Township, Cook County, Ill., and Deerfield Township, Lake County, Ill., for the Illinois State Toll Highway Commission, Chicago; bids Jan. 24.

350 tons, Northern Illinois toll highway contract N-4C, including erection of precast concrete bridges, Rutland and Dundee Townships, Kane County, Ill., for the Illinois State Toll Highway Commission, Chicago; bids Jan. 24.

262 tons, North Illinois toll route contract N-1C, including precast concrete bridges, Roscoe Township, Winnebago County, Ill., for the Illinois State Toll Highway Commission, Chicago; bids Jan. 17.

220 tons, building, University of Massachusetts, Amherst, Mass.; H. M. Purrington Co., Providence, R.I., general contractor.

215 tons, building, University of Massachusetts, Amherst, Mass.; M. S. Kelliher Co., Boston, general contractor.

PLATES . . .

PLATES PLACED

700 tons, including about 100 tons of shapes, Bureau of Reclamation, pump house and storage, near Bridgeport, Wash., to United Concrete Pipe Co., Auburn, Wash.; Alton V. Phillips Co., Seattle, general contractor.

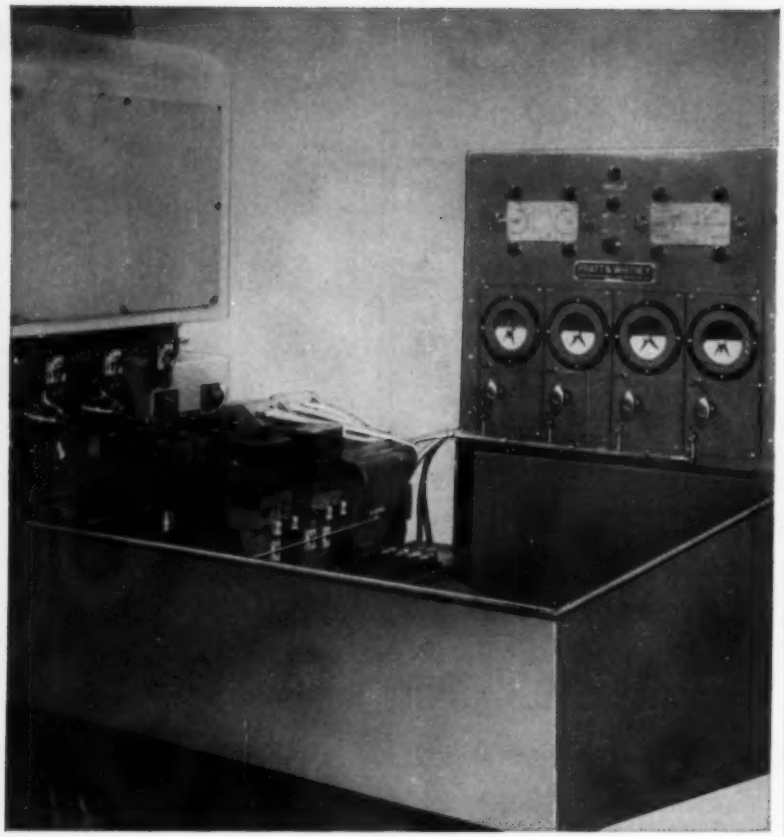
PLATES PENDING

7000 tons, 20 miles of 42 to 60-in. water supply line; bids to Salem, Oreg., late January.

RAILS, CARS . . .

RAILROAD CARS PLACED

Virginian Railway, 500 seventy-ton hopper cars, to Bethlehem Steel Co.'s plant at Johnstown, Pa.



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THE NEW APPROACH TO HIGHER ACCURACY AT LOWER COST – Pratt & Whitney Automation Gaging Systems have been successfully applied to a wide variety of machines for both parts and continuous production. In a typical installation . . . an automatic dual boring machine producing precision small parts . . . P&W Gage Heads check the workpieces as they are machined. Gage impulses, fed back to the machine, are used to re-set the cutting tools automatically *before* required tolerances are exceeded. Results: Accuracy is held to .0003" at the very high output rate of 120 pieces per hour. Reject losses are practically eliminated!

Write for more information
Pratt & Whitney Company, Incorporated,
13 Charter Oak Boulevard,
West Hartford, Connecticut

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CONVENTIONAL GAGES . . . THREAD COMPARATORS . . . AUTOMATION AND CONTINUOUS GAGES

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MACHINE TOOLS • GAGES • CUTTING TOOLS

Advertising Index

Acme Welding Division of The United Tool & Die Co. 87
Aetna-Standard Engineering Co., The ..... Inside Back Cover
Ajax Electric Co., Inc. 94
Alco Products, Inc. 129
Allis-Chalmers ..... Inside Front Cover
Allis, Louis, Co., The 114
Allison Division, American Chain & Cable .. 99
Aluminum Company of America 66, 67
American Chain & Cable, Allison Division .. 99
American Metal Market 109
American MonoRail Co. 134
American Welding & Manufacturing Co., The 30
Associated Spring Corporation, Wallace Barnes Steel Division 93
Atlas Car & Mfg. Co., The 10

Baker-Raulang Co., The 3
Barnes, Wallace, Steel Division, Associated Spring Corporation 93
Bethlehem Steel Co. 1
Bliss, E. W., Co., Mackintosh-Hemphill Division 7
Bohn Aluminum & Brass Corporation 85

Chambersburg Engineering Co. 123
Chicago Rawhide Manufacturing Co., Sirvis Division 45
Chicago Steel Service Co. 104
Cincinnati Milling Machine Co., The 46
Clark Controller Co., The 13
Cleveland Grinding Machine Co., The 106
Cleveland Tramrail Division, The Cleveland Crane & Engineering Co. 98
Colorado Fuel & Iron Corporation, The 18, 19, 96, 97
Columbus McKinnon Chain Corporation 16
Crucible Steel Company of America 110

Danly Machine Specialties, Inc. 17
Detroit Broach & Machine Co. 54
Detroit Steel Corporation 34, 56
Dresser Manufacturing Division, Dresser Industries, Inc. 123

Eastern Machine Screw Corporation, The 124
Erie Forge & Steel Corporation 8, 9

Fafnir Bearing Co., The 68
Femco, Inc. 108

Gates Rubber Co., The 100
Great Lakes Steel Corporation 50

Harnischfeger Corporation 90
Hepponstall Co. 58
Herr Equipment Corporation, The 12
Hill Acme Co., The, Cleveland Knife Division 124
Hydraulic Press Mfg. Co., The, A Division of Koehring Co. 102

Joliet Wrought Washer Co. 21

Kaiser Aluminum & Chemical Sales, Inc., Kaiser Chemicals Division 2
Kaiser Steel Corporation 131
Koehring Co., The Hydraulic Press Mfg. Co. Division 102

Laminated Shim Co., Inc., Stampings Division 112
Landis Machine Co. 20
Linde Air Products Co., A Division of Union Carbide & Carbon Corporation 36
Link-Belt Co. 24
Lurie Brothers & Co., Inc. 127

Mackintosh-Hemphill Division, E. W. Bliss Co. 7
Marchant, Geo. F., Co. 108
Miller Electric Manufacturing Co., Inc. 107

National Steel Corporation 50
Nergren, C. A., Co. 11
Norton Co. 14, 15

Pheoll Manufacturing Co. 57
Pratt & Whitney Co., Inc. 132

Reliance Steel Division, Detroit Steel Corporation 56
Republic Steel Corporation 22, 23
Robbins & Myers, Inc., Hoist & Crane Division 80
Ryerson, Joseph T., & Son, Inc. 33

Service Steel 124
Simonds Abrasive Co. 62, 63
Square D Co. 79
Standard Pressed Steel Co., Unbrako Socket Screw Division 25

Timken Roller Bearing Co., The, Steel & Tube Division ..... Back Cover

Union Carbide & Carbon Corporation, Linde Air Products Co. 36
United States Rubber Co., Mechanical Goods Division 77
United Tool & Die Co., The, Acme Welding Division 87

Veeder-Root, Inc. 4
Verson Allsteel Press Co. 53
Virginia Electric & Power Co. 101

Ward Steel Co. 6
Washburn Wire Co. 29
Westinghouse Electric Corporation 26, 27, 82, 83
Wheelabrator Corporation 28
Wickwire-Spencer Steel Division of The Colorado Fuel & Iron Corporation 18, 19, 96, 97

~ ~ ~

Table of Contents, Page 5

Classified Advertising, Page 131

HERE'S HELP for your tooling problems

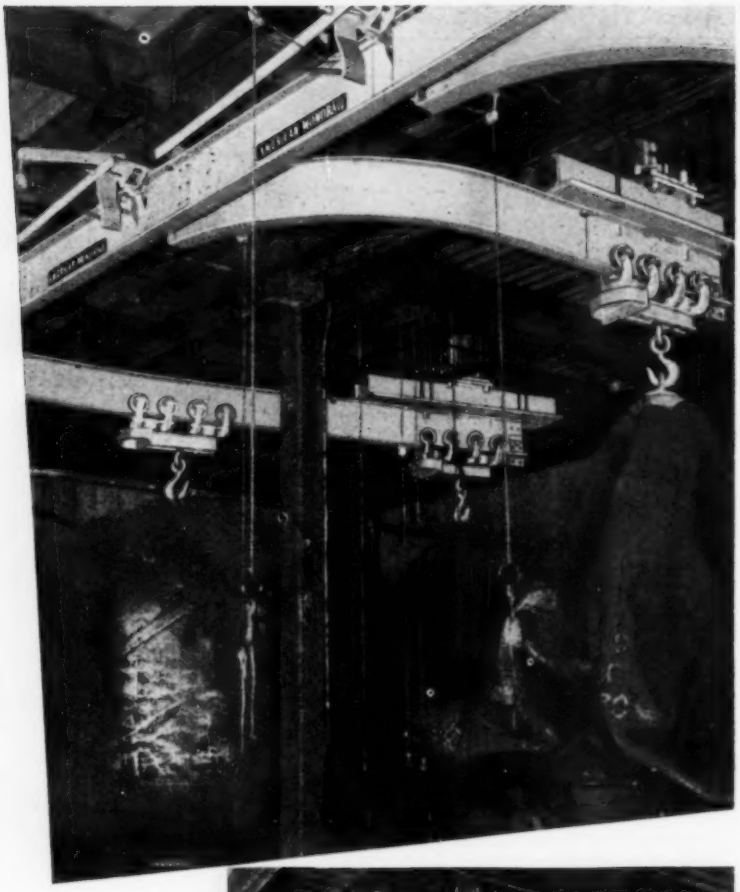
Looking for a tool steel to do a specific job? Want to know where to buy a finishing carbide? This guide has the answers. It is a single source of information on more than a thousand different tooling materials. Knowing the job to be done, you can determine, with the guide, what product to buy and where to buy it. Cross indexes make it easy to locate tool steels and carbides by tradename, or to compile a list of sources for a single type.

40 PAGES

Copies of the Guide to Tool Steels & Carbides are available from Editorial Service, STEEL, Penton Bldg., Cleveland 13, O., at the following prices:

1 to 10	$2.00 ea.
11 to 50	1.90 ea.
51 to 100	1.80 ea.
101 to 200	1.70 ea.
over 200	1.60 ea.

Teamed Engineering for EFFICIENT SEALDBULK HANDLING



U. S. Rubber Company and American MonoRail Engineers teamed up to develop this system.

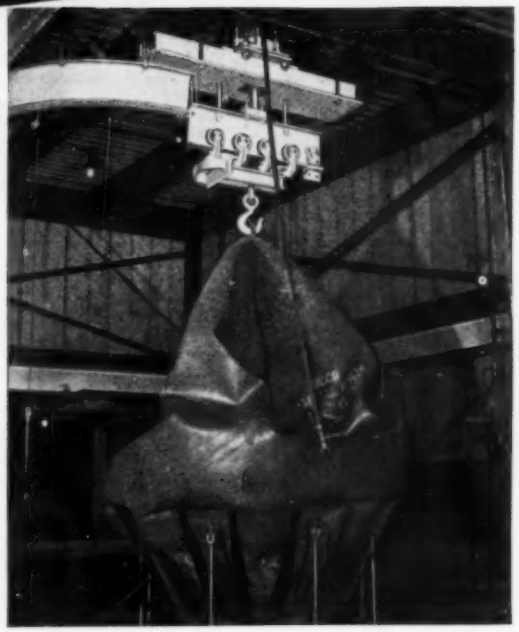
The Sealdbin containers, a product of U. S. Rubber Co., each hold 11,000 pounds of costly carbon black. This American MonoRail System moves the Sealdbins from flat cars or trucks to special stations for discharge. Empty deflated containers are returned to the supplier for re-use.

Working together this expert team has minimized manual labor, time, and waste.

If you have a materials handling problem, call your nearby MonoRail Engineer or write us.

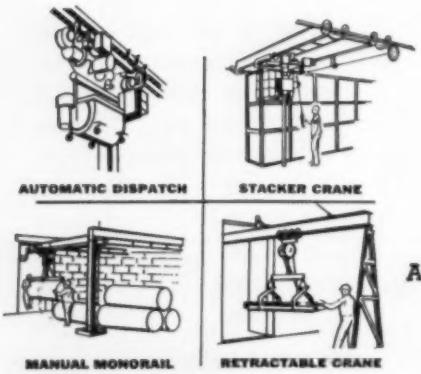
Send for Bulletin C-1.

US RUBBER



Member of Materials Handling Institute and MonoRail Mfrs. Assn.

For Power Driven Conveyors, Use Lundahl Chainless Conveyors

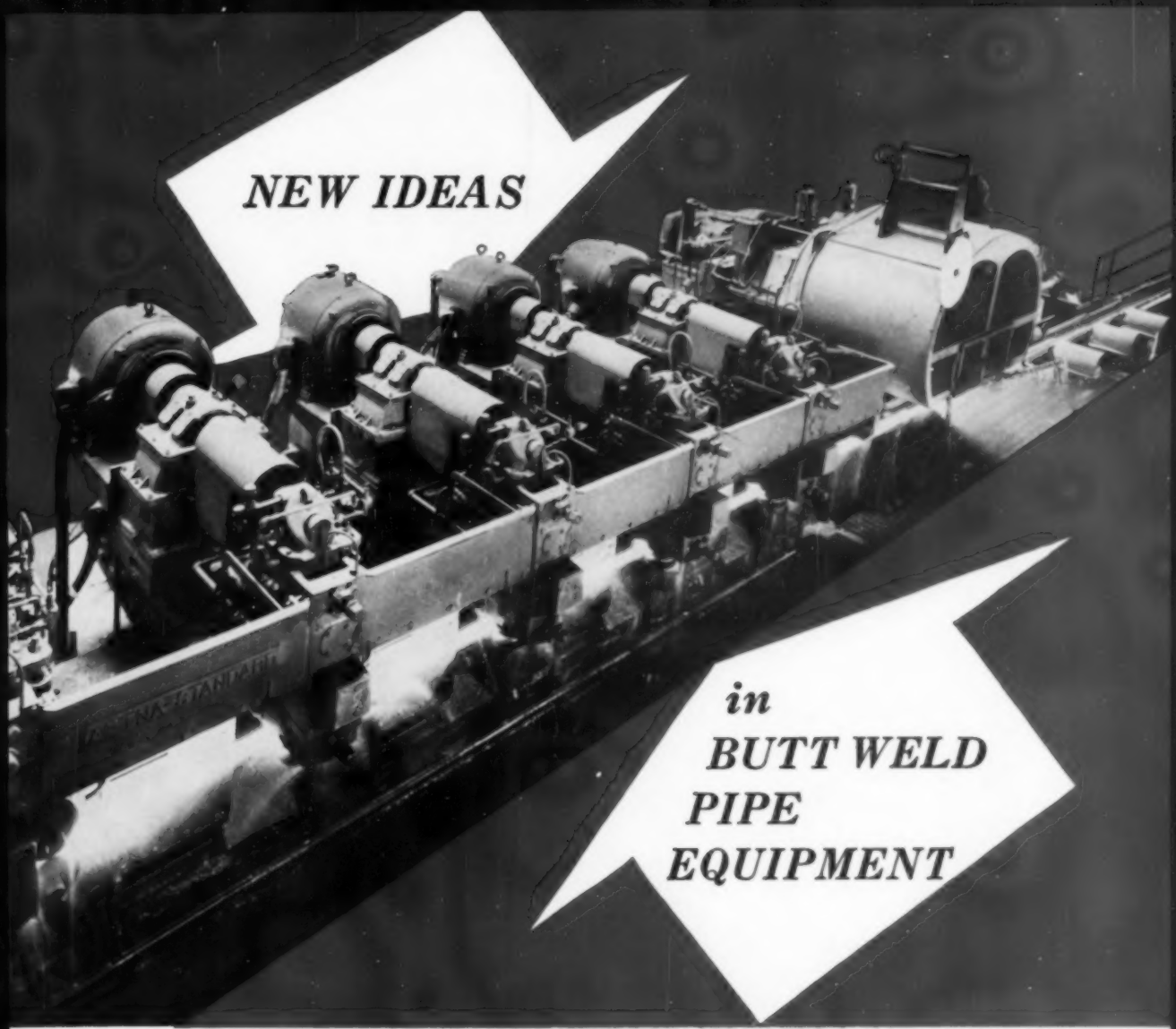


AMERICAN MONORAIL COMPANY

OVERHEAD HANDLING EQUIPMENT

13102 ATHENS AVENUE • CLEVELAND 7, OHIO

(IN CANADA—CANADIAN MONORAIL CO., LTD., GALT, ONT.)



UNCOILER-LEVELLER . . . Equipment includes automatic handling, weighing, storage, and uncoiling of coiled skelp ahead of flash welder. One man operation. Improved leveller has skelp deflector roll, adjustable independent of leveller roll bank.

ROTARY FLYING HOT SAW . . . Saw adjustments can be made to select any cutting length without reducing delivery speed from mill. Saw adjustment permits cutting single pipe lengths from 18 feet to 60 feet.

AUTOMATIC PIPE SELECTOR releases pipe at predetermined intervals. Controls gap between consecutive lengths of pipe. Eliminates overlapping of pipes as they enter Straightener. Eliminates need for operator to regulate continuous flow of pipe.

TRAVELING CRADLES facilitate removal of crane lifts of pipe from the line of production to maintain full mill efficiency.

POSITIVE TRANSFER of pipe from Screw Type Kickoff, following Sizing Mill, to Screw Type Cooling Bed.

AETNA • STANDARD

THE AETNA-STANDARD ENGINEERING COMPANY

GENERAL OFFICES: PITTSBURGH, PA. **PLANTS: ELLWOOD CITY, PA., WARREN, OHIO**

CONTINUOUS GALVANIZING LINES • CONTINUOUS ELECTROLYTIC TINNING LINES • SIDE TRIMMING AND SHEAR LINES AND OTHER FINISHING EQUIPMENT • CONTINUOUS BUTT WELD PIPE MILLS • SEAMLESS TUBE MILLS • DRAWBENCHES AND OTHER COLD DRAW EQUIPMENT • ROLLS AND CASTINGS • EXTRUDERS, MILLS, PRESSES FOR RUBBER AND PLASTIC

How to make your automatic heat-treating and hardening even more automatic

...at no extra cost

FAST, continuous operation is the key to profitable automatic forging production lines. Especially in high speed heat-treating and hardening operations. They're extremely sensitive to changes in chemical composition and structure of steel used. Interruptions to make tests or adjustments slow production, increase costs, reduce the advantages of automatic operation. This makes the uniformity of the steel you use an even more vital factor. The more uniform the steel, the steadier the production and the greater the potential you can realize from your automatic equipment.

You can get the utmost in uniformity, and automatic operation—at no extra cost—by using Timken® fine alloy steel. Uniformity is constant from bar to bar, heat to heat, order to order.

We take many extra quality-control steps to assure this uniformity. For example, the Timken Company uses a magnetic stirrer for molten steel to assure equal distribution of alloys, uniform temperature and improved working of the slag. It's the first installation of its type in the United States.

To further assure uniformity, your order of Timken fine alloy steel is handled individually. We target our conditioning procedures to meet your end use requirements. Each bar is stamped to identify the heat it came from. This limits variations within an order as well as from order to order. And every heat is examined spectrometrically to insure uniform grain size.

To make your automatic heat-treating and hardening operations even *more* automatic—at no extra cost—always specify Timken fine alloy steel. You'll get money-saving performance and uniform results every time. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

TIMKEN *Fine Alloy* **STEEL**

TRADE-MARK REG. U.S. PAT. OFF.

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS STEEL TUBING